Art & Industry

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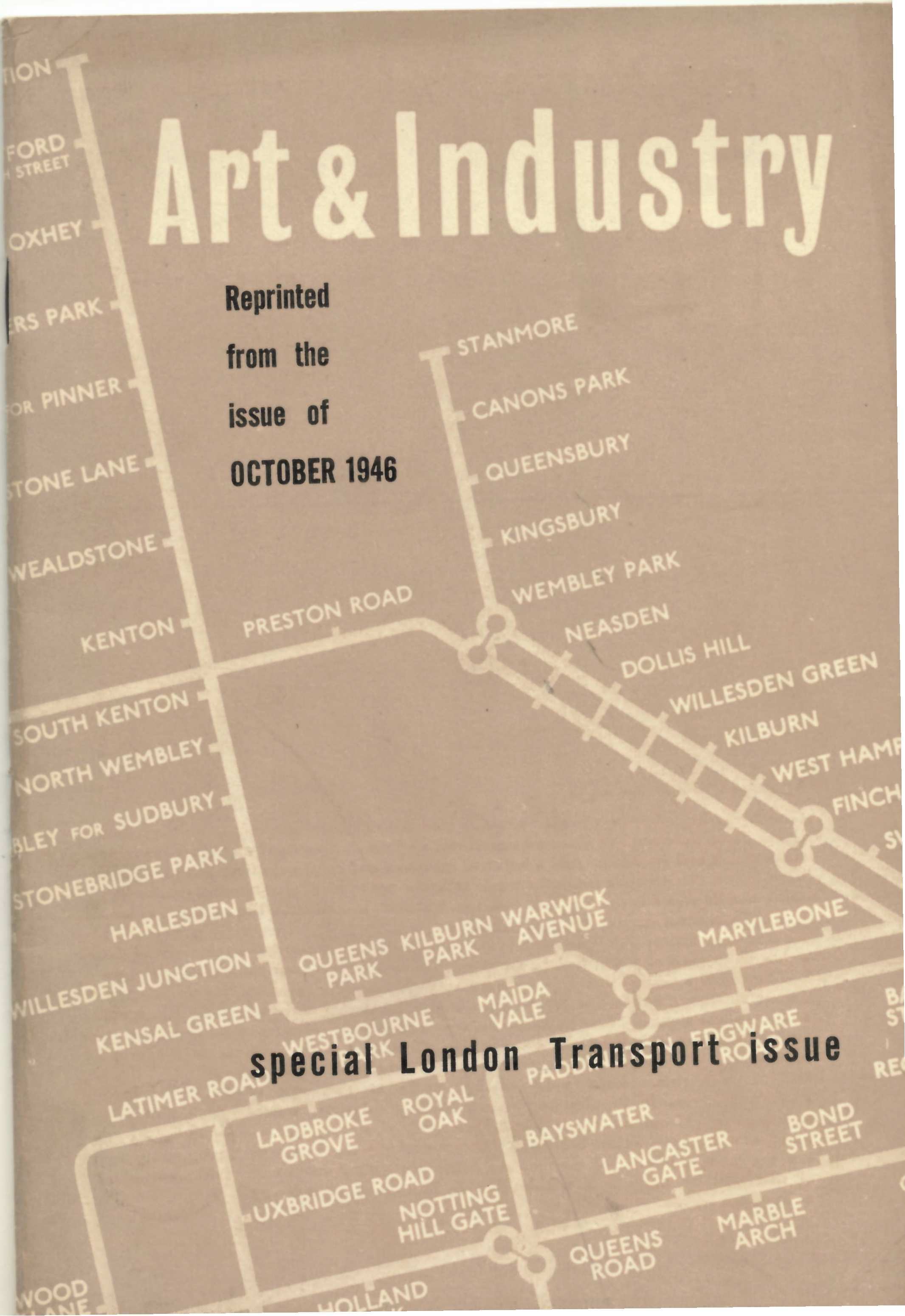
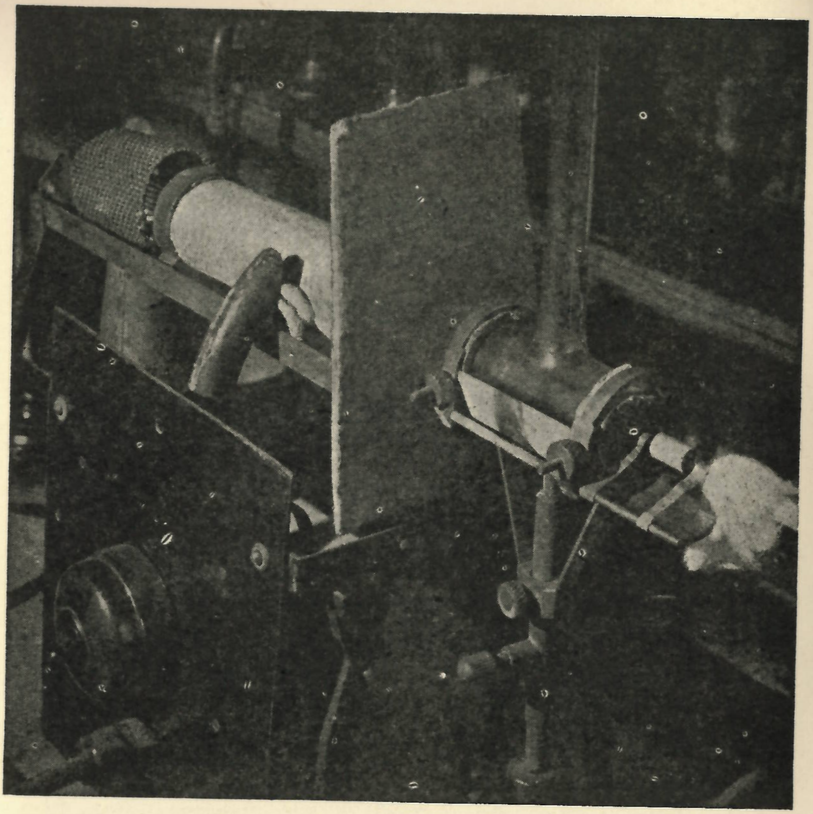
special London Transport issue





Trial by Fire

Give him a bag of coke, a bucket of water, and the necessary apparatus, and the chemist can build up thousands of different substances — from alcohol and ' meta fuel ' to aspirin, motor spirit and food fats. Add a bottle of ammonia and he can turn out thousands more. To perform this modern magic he needs to know not merely what elements make up the substance he wants to prepare, but how much of each it contains. The majority of known chemicals contain carbon and hydrogen, usually oxygen, and frequently nitrogen. The chemist uses the combustion tube, illustrated above, to find out the proportions of these. A few milligrams of the substance are enough (and there are over twenty-eight thousand milligrams in a single ounce). These are strongly heated in a current of air or oxygen. As the substance burns, the carbon in it is converted into carbon dioxide gas, and the hydrogen into steam. These products are collected in weighed parts of the apparatus, and from the amounts formed the chemist can calculate the composition of the original substance. A simple experiment — yet it demands refined, reliable apparatus. Data provided by it lie at the root of modern progress in biochemistry, chemotherapy, dyeing, waterproofing, nutritional and agricultural chemistry, photography, and many other aspects of civilised life. Every working day throughout the year hundreds of combustion tubes are giving the result of this trial by fire which enables the British chemical industry to serve the nation.

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CONTENTS

EDITORIAL 97

FOREWORD By the Rt. Hon. Lord Ashfield, P.C. 97

LIVING DESIGN—LONDON TRANSPORT By Norbert Dutton, M.S.I.A. 98

NOTES AND NEWS 124

THE LONDON PASSENGER TRANSPORT BOARD and, preceding it, the Underground Group of Companies have set an outstanding example of the co-ordinated use of industrial design in the service of the community on a large and growing scale. This achievement is second to none and has aroused admiration throughout the world. The success it has attained is largely due to two men, Lord Ashfield, the chairman of the Board, and the late Frank Pick who will go down to posterity as a pioneer and one of the greatest contributors to the progress of industrial design in the twentieth century.

The story of industrial design in connection with London Transport is one of vision, zeal, faith and continuous effort inspiring alike to industry, the designer and the student and particularly encouraging to all those now seeking to apply it to the revival of British Trade. *Art and Industry* therefore invited Norbert Dutton, M.S.I.A., himself one of the best and most understanding of our younger generation of practical visionaries engaged in the exacting profession of industrial design, to undertake this comprehensive if concise review. How well he has done his job is reflected in the Foreword contributed by Lord Ashfield, which follows.

On behalf of Mr. Dutton and himself, the Editor expresses grateful thanks to all departmental managers and specialists for the enthusiastic co-operation they have given and the patience they have shown in connection with the preliminary research which has gone into the preparation of this effort.

The Editor.

FOREWORD by THE RT. HON. LORD ASHFIELD, P.C.

ON THE FORMATION of the London Passenger Transport Board in 1933 we were faced with the domestic problem—a difficult one—of welding together into one organization the variety of undertakings of which we assumed control. From the outset of this task the vital part, which a standard motif—at once both functional and æsthetic, progressive and not static—in the design of new buildings and vehicles would play in symbolizing the integration of London's passenger transport services in the eyes of the public, was fully recognized.

We believe, too, that design forms an essential part in our plan for the improvement and expansion of travel facilities in Greater London and for providing still greater comfort for the travelling public whom we serve.

It is for these reasons that, in our plans for reconstruction and improvement, the work of the designer and the engineer are so closely co-ordinated from the earliest stages in production until the completion of the finished article, whether it be station or garage, train or trolleybus, bus or coach.

London Transport is indeed justly proud of the reputation it has built up in the field of design, and I should like, on behalf of the Board, to express our thanks to the author of this review for his ample and able exposition of our work. Believing as we do that efficiency in design is synonymous with efficiency in service, I need hardly say that the design of the buildings and vehicles of the future will receive the same unremitting care as it has done in the past.

Ashfield.

LIVING DESIGN

A REVIEW OF LONDON TRANSPORT

By NORBERT DUTTON, M.S.I.A.

PROBABLY NO ORGANIZATION in the world has employed good design with more consistency and success than the London Passenger Transport Board. Three factors have combined to make this success possible, the variety, the scale, and the continuous enlargement of its undertakings. Variety is provided by the unified control of road and rail services, involving responsibility not only for the design of vehicles, but also for that of stations, depots, and offices, together with their equipment; and for ancillary services such as the provision of information and publicity, the printing of tickets and time tables, and the maintenance of public shelters and signs. Scale is determined by its field of operation—an area of 1,986 square miles with a population of some nine million inhabitants. Each weekday London Central buses alone, carrying 6,000,000 passengers, travel an aggregate distance of 600,000 miles; and during the peak hour, Piccadilly station alone handles some 24,000 passengers.

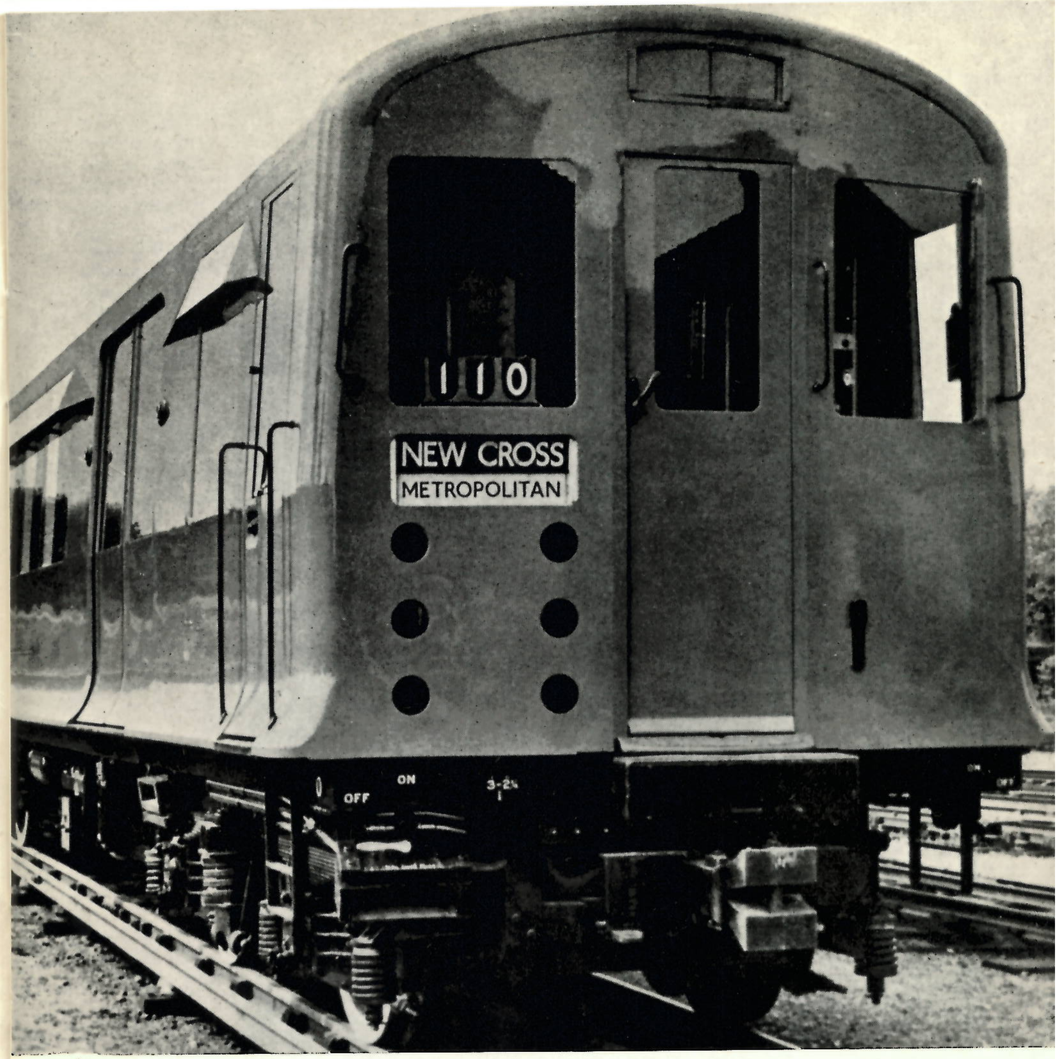
Apart from the normal replacement of rolling stock, the growing population of London has necessitated the continuous and rapid development of its transport services. The tempo of this progressive development involves an unending series of fresh problems and provides a means of trying out many alternative solutions.

In its application of design to the widely differing fields of vehicles, architecture, equipment and typography, London Transport has achieved an idiom which is immediately recognizable and yet defeats ready analysis. The unity is apparent, as a glance at the accompanying illustrations will show, while the scale of variation is almost unlimited. To the student of design, the rarity of such an achievement makes an attempt at its analysis worth while.

First and foremost, London Transport design is not merely practical, as all good design must be, but is manifestly shaped and directed by practical considerations. The lettering we admire for its form and character is concerned primarily with legibility; the clean exterior surfaces of a train are imperative for efficient washing; the dimensions of road vehicles are determined to an inch by statutory requirements. Efficiency in operation combined with ease of maintenance is the first condition. But this factor alone would not ensure the contemporary character which is unfailingly achieved. The use of good design has become a tradition, but the design itself is never traditional, never merely the application of a formula. A readiness to seek new solutions, to experiment with new methods and materials, to evolve a fresh visual statement unrestricted by, and yet always in harmony with what has gone before, is an essence of the idiom.

London Transport design is supremely impersonal, and at the same time convincingly English. Form becomes a simple and unpretentious statement of function, never an overstatement and never decorated with the trappings of 'sales appeal'. Since the Board provides not a commodity but a service, design can be treated on its merits and not in the light of hazardous estimates of public preference. No one who has designed for the commodity market will underestimate the importance of this consideration. The absence of competition might indeed have been made an excuse for a far less progressive attitude to the whole question of design had not the Board interpreted its responsibilities to the public in a wide sense.

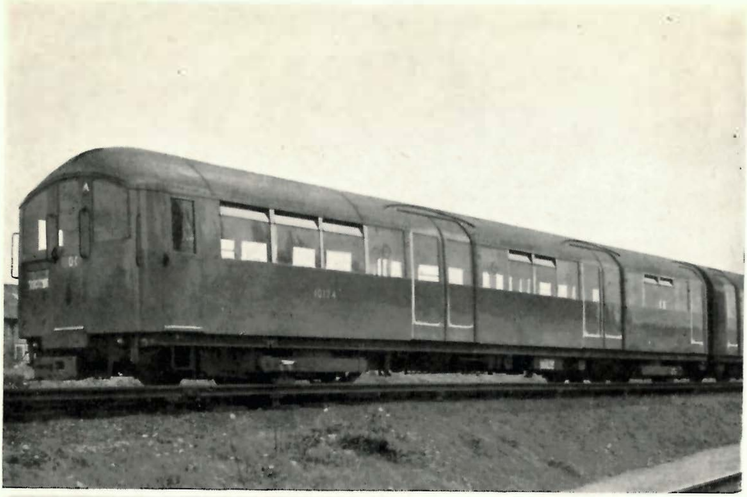
There is nothing fortuitous about the visual character we associate with London Transport; it could only be achieved by the conscious and continuous recognition of good design as a worth while objective. It is effort, not accident, which has developed the idiom; subtle but unmistakable, orderly yet never austere, infinitely flexible, contemporary yet never ephemeral, urbane, impersonal, intrinsically English: an idiom so pervasive as to weld into a recognizable unity the independent efforts of many architects, designers, and engineers working in a multiplicity of different media. Analysis must surely yield some unifying principle behind an achievement so rare in the whole history of design. And indeed it does: but a principle so subtle as to have escaped the conscious perception even of those designers who have been most closely concerned in its application. The character of London Transport design is essentially geometric. It is the interplay of horizontal and vertical lines and planes which imposes on a diversity of materials a controlling harmony of forms. In this superb example of visual co-ordination, it is a structure of horizontals and verticals which provides the *ordinates*.



Fitting frontispiece to a review of transport design, this modern motor coach was put into service in 1938. As an exercise in functional simplicity it will stand comparison with any of its much-publicized foreign contemporaries; indeed it achieves a standard of sophistication which they rarely attempt. The basic form is neither modified nor embellished in the conscious pursuit of 'sales appeal'. It remains an unadorned statement of the harmonious resolution of physical problems.

Note how the number plate, destination board and ports for marker lights are welded into a unified pattern. Smooth contours, flush windows and an absence of vertical projections make it easy to clean in a mechanized washing shed, where the coach passes a battery of wipers mounted on vertical revolving spindles. The weather guards which enclose ventilating panels above the windows afford the eye a welcome horizontal interest, punctuated by a recurring aperture for the doors, while the outswept body panels embrace the footboards in an unbroken contour.

This coach may justly be classed with Mitchell's Spitfire and the reinforced concrete structures of Maillart as a pure engineering solution which achieves, in its logic and integration, the most profound visual satisfaction.



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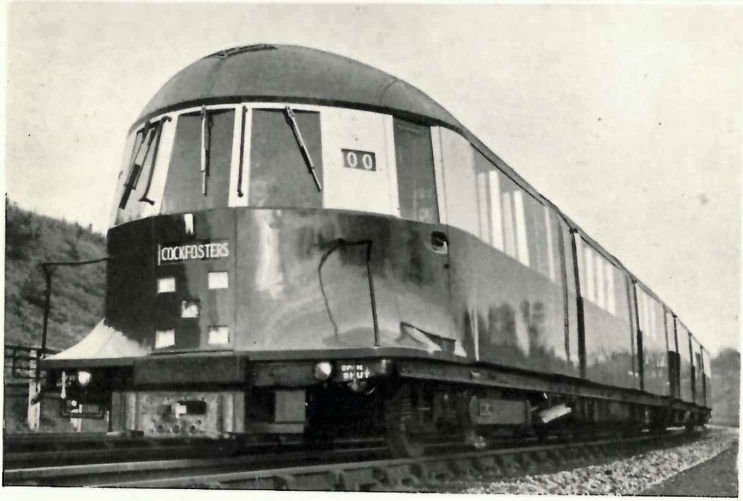

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The interior of a transport vehicle should be restful in appearance, providing a visual field in which the eye is not stimulated but relaxed, the mind left free to concentrate. This restfulness is not achieved by the suppression of detail, for that, even if it were possible, would result in a sterile monotony; but by the unification of details into a complete and harmonious composition. The early trains consisted of a coachwork shell inside which all kinds of equipment—seats, handrails, light fittings, draught screens, information panels and so on—were screwed into position. The individual forms were so unrelated, and the method of fixing so apparent, that the eye was rapidly fatigued by this variety of shapes, colours, and arrangement.

Development in the design of trains reflects a continuous progress from assembly to integration. In a modern coach, structure, fittings, and equipment are successfully harmonized. A dominant horizontal emphasis is provided by the continuous window line, punctuated at regular intervals by the vertical mullions and carried without interruption across the doors. Internally, the height of seating coincides with the bottom edge of the windows, creating a horizontal plane which embraces the whole compartment, and within which the interplay of lateral and transverse seating affords visual interest. A similar emphasis appears in the advertisement and map panels above the windows, and in the double row of light fittings. The problem of interior layout has been so successfully resolved that it is difficult to anticipate further developments except in the matter of materials and finishes, which are the subject of continual experiment.

The Metropolitan Line, however, sets a different problem for the designer in the planning of long distance surface line cars. Within the central area they must provide the maximum accommodation during peak hours (in other words, there must be ample room for standing passengers), while outside this area they become in effect a suburban service, in which a higher standard of comfort for a progressively smaller number of passengers is demanded. The first post-war experimental car, designed to meet these requirements, is now in service between Aldgate and Rickmansworth.

It incorporates a new seat plan, fluorescent lighting, and luggage racks over all seats.

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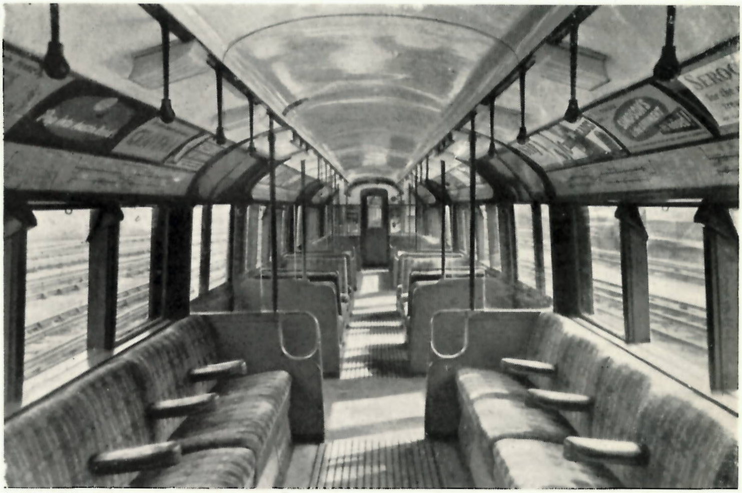

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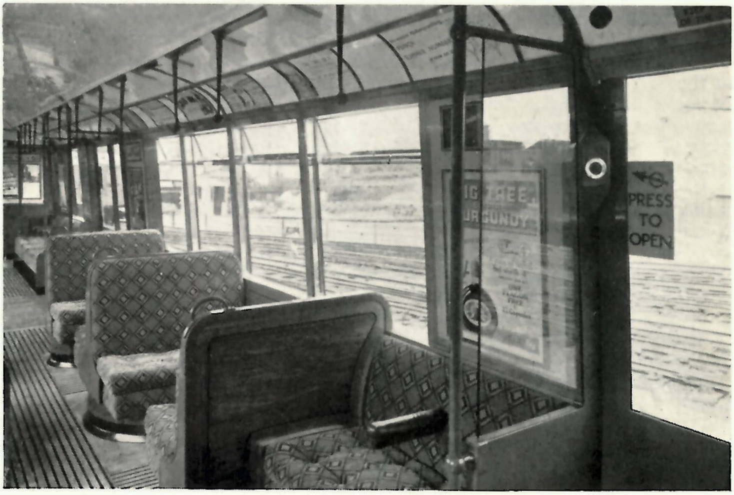

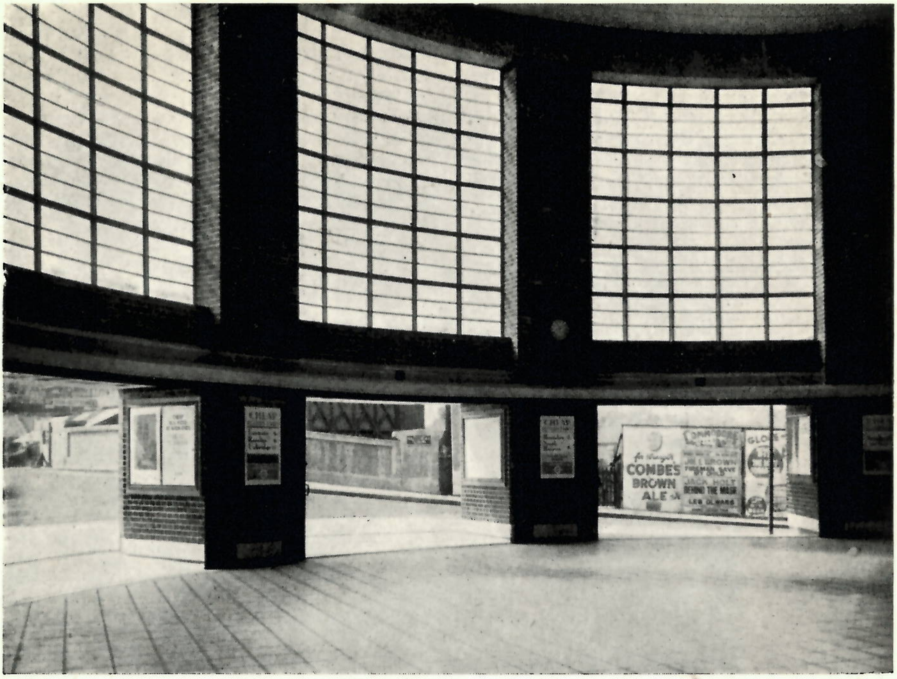

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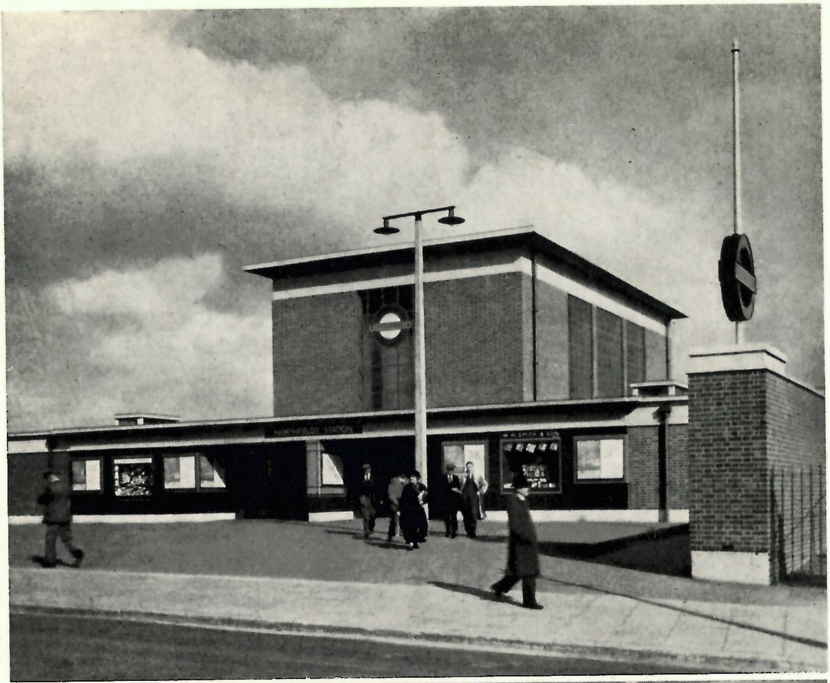
When you set foot inside a modern Underground station, you become part of an integrated and highly efficient transport system. The spacious concourse is clearly designed for handling traffic; booking office and ticket machines line your route without obstructing it. Your path from the entrance to the escalator lies in a straight line. You are not impeded at the barrier by passengers travelling in the opposite direction, for they are guided through a separate exit. As you step off the escalator your platform is clearly indicated by prominent and legible signs, and when you reach it, the sequence of incoming trains is similarly indicated on an electrically controlled panel. Your train having entered the station, you have only to step through the doors which open at your approach and close automatically behind you.

Since the Underground stations have been constructed at different times during the last 75 years, it is inevitable that they should vary considerably in efficiency. The most recent examples, located at a progressively increasing distance from the congested central area, are naturally the most successful. Apart from the value of profiting by past experience, site conditions generally permit a much freer plan form. Construction of the early stations presented many difficulties, including the obstruction to tunnelling presented by a maze of sewers, gas and water mains, and sometimes subterranean rivers. These obstacles, and the nature of the soil, explain why London's Underground operates at far greater depth than those of Paris, Berlin, and New York. But if the early stations, inherited by the Board when it came into being, are the least satisfactory feature of the present system, their modern counterparts represent perhaps its outstanding achievement.

These stations are the embodiment of functional architecture. The rapid dispersal of regular concentrations of passengers requires a spacious concourse with the maximum provision for entrance and exit, producing a floor plan which determines the massive scale of the superstructure. Where provision is made for shops or kiosks they are integrated with, and in fact contribute to, the structural composition.

A notable feature of the Underground stations is the way in which the equipment is integrated in appearance with their structure. Examination will show that each separate piece of equipment is a carefully considered,



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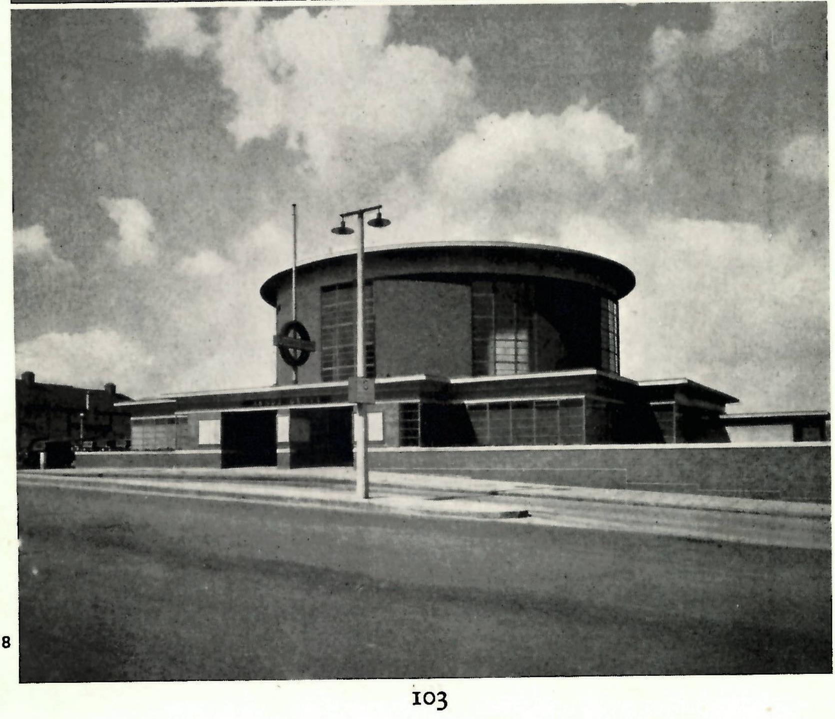

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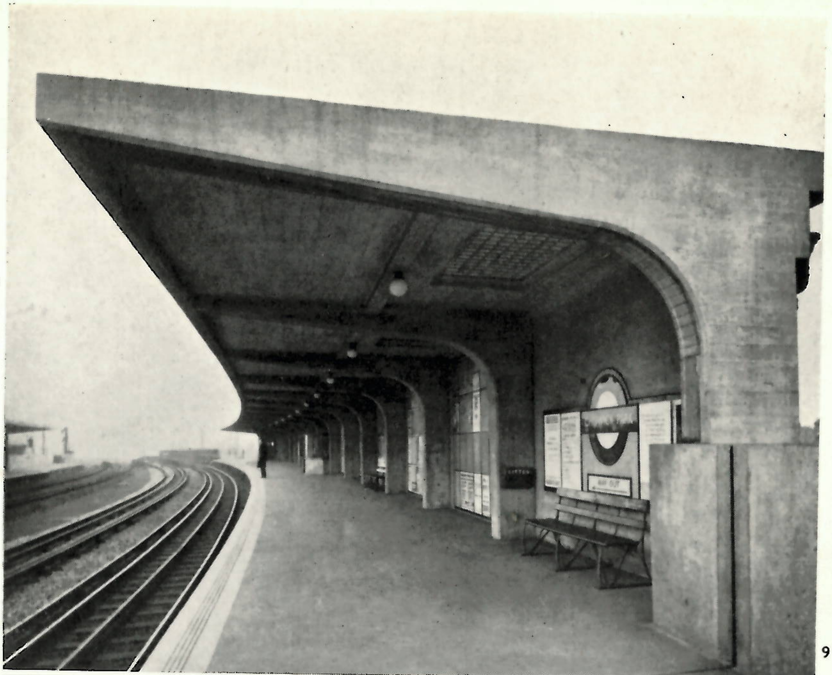

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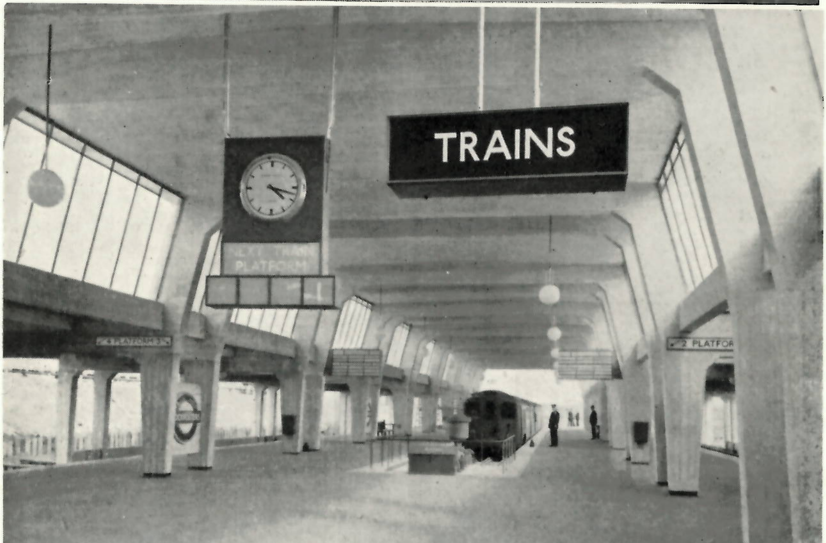

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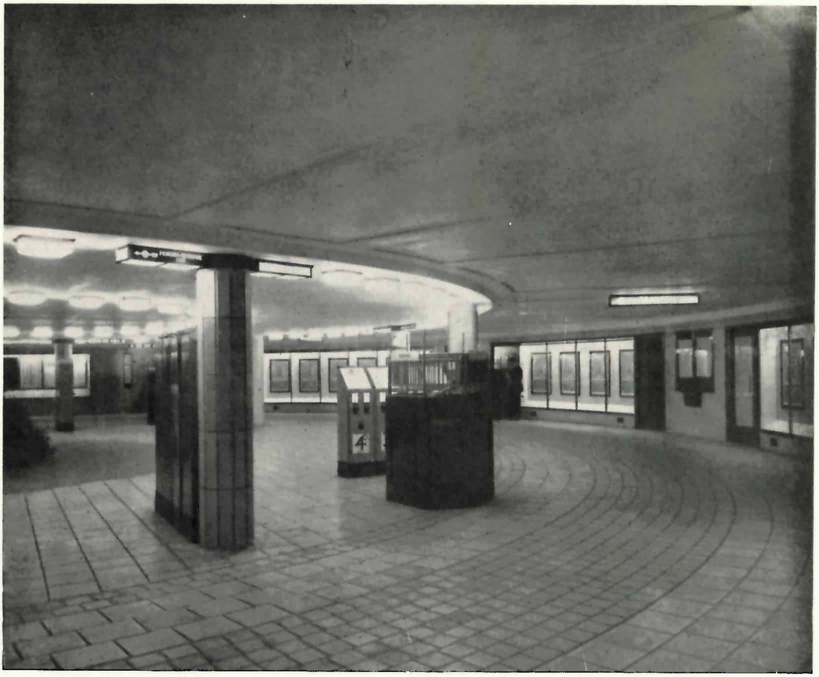

11

and frequently a highly successful, essay in design; yet individually they are never obtrusive, but are seen only as elements in a larger plan. This is exemplified in the photographs on this and other pages, particularly the fire-fighting apparatus (34) and the seat at Hammersmith (37). The adoption of a single style of lettering, and the recurring use of the London Transport symbol as a decorative motif, contribute powerfully to a visual unity. So too does the use of repetition, as in the ticket machines, where the unit becomes, as it were, a module from which composite patterns are constructed.

The siting of posters deserves particular study. Booking halls and the exterior surface of the station are reserved for the Board's own posters, each of which is located in a separate frame. These frames are treated as an architectural feature, so that even the posters become an integral part of the building, more akin to mural decoration than to advertisements (6, 35). In this way London Transport has been able to employ designers of outstanding talent and individuality, and yet subordinate their work to an overall plan and impart to it a unifying character.

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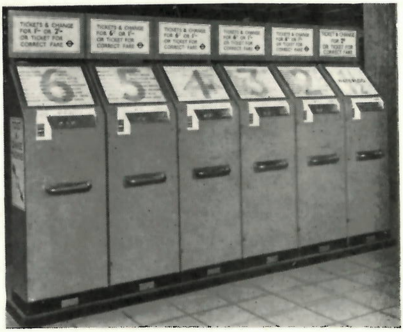

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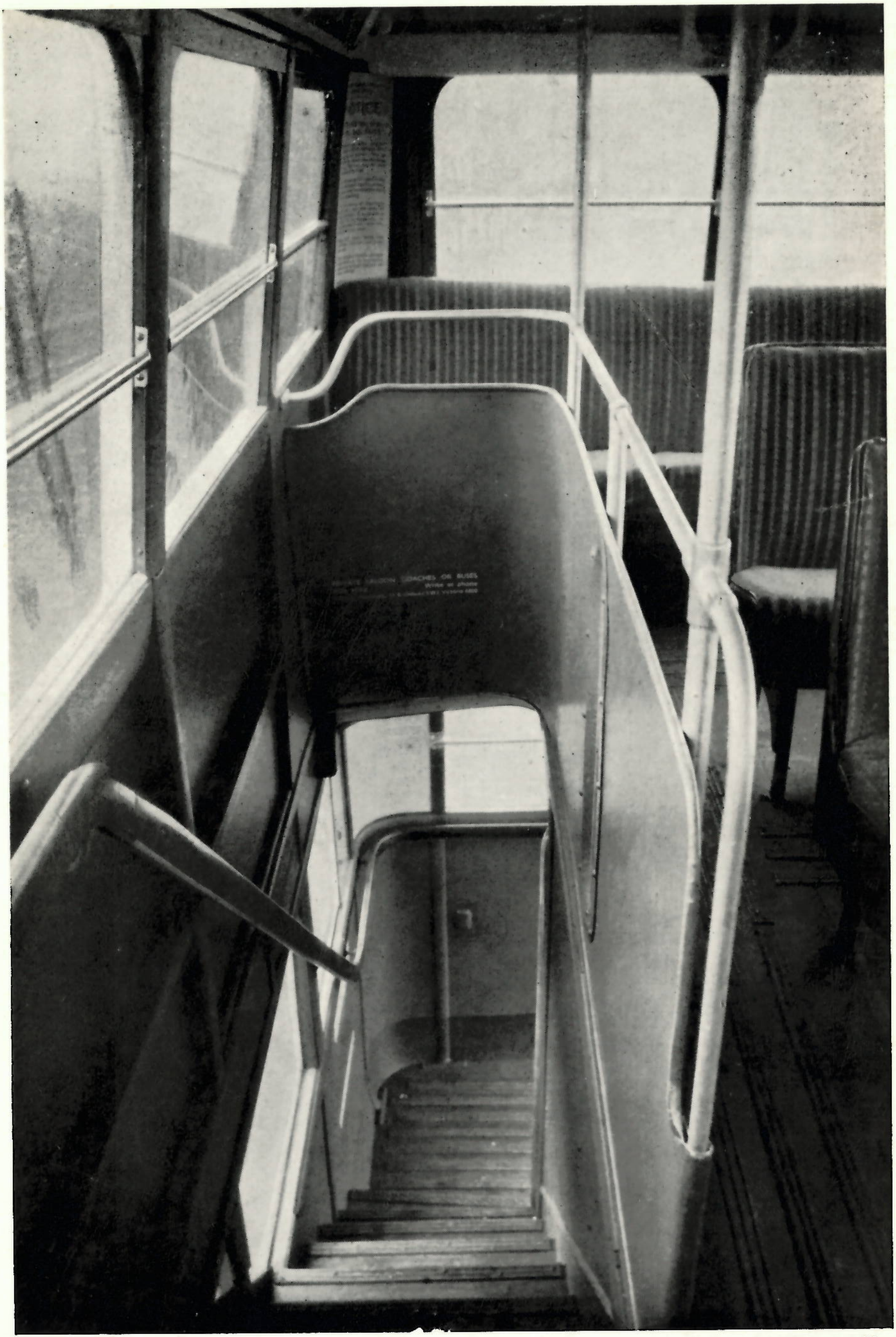

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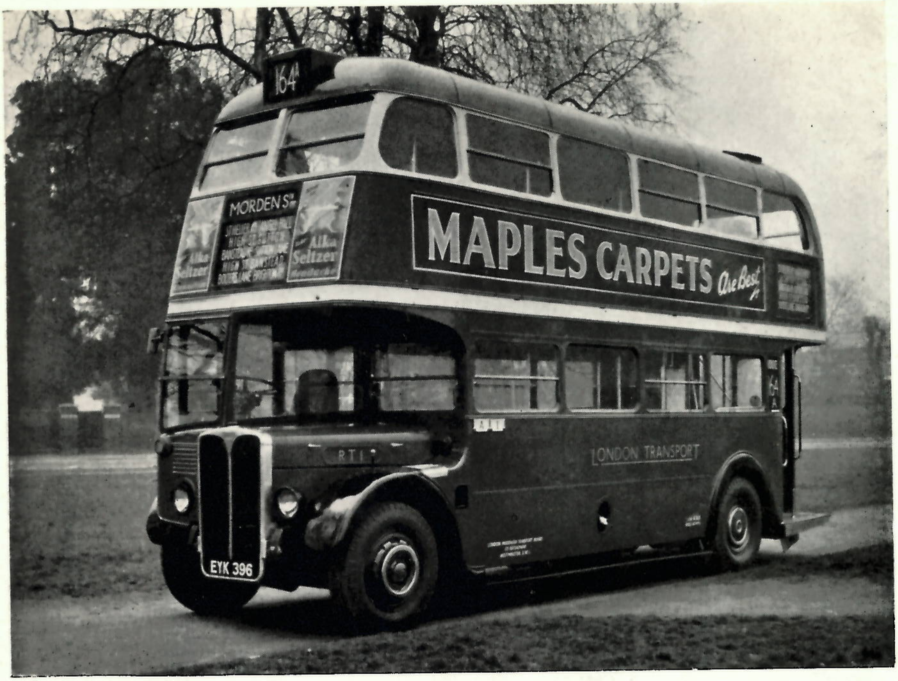

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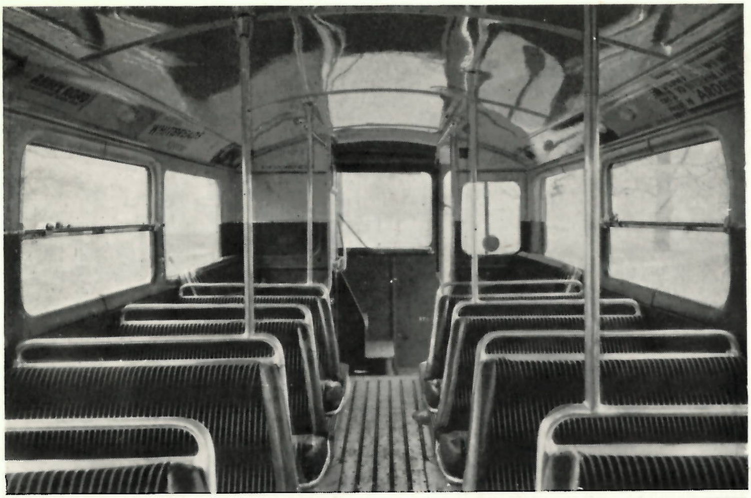
Bus design is controlled within rigid limits by statutory regulations, which, besides defining the maximum weight and principal dimensions, determine various other factors such as the turning circle, angle of stability, type of brakes and springing, and so on. The orthodox appearance of London's most recent type (15) is not, however, the outcome of these requirements, nor is it the result of a conservative policy. Within the limits imposed, many unconventional variants have been experimented with, but have failed so far to justify any radical departure from the present layout. A rear entrance permits the most rapid loading, and affords the greatest degree of security from accidents to passengers when boarding and alighting. For this reason a rear engine, which offers certain advantages, is not practicable, nor, in a double-decker, can the engine be located under the floor without prejudice to adequate headroom and a low centre of gravity. A full-fronted body like that of the trolleybus (19) has been rejected in favour of the 'half-cab' on the score of improved vision for the driver and the greater accessibility of the engine.

This bus achieves a thoroughly logical form, with its clean contour, radiused corners and strong horizontal emphasis. It will be observed that no attempt is made to suggest a 'streamlined' shape. On this subject the view of one of the Board's Engineers deserves quotation: that 'painting lines upon the outside of vehicles bearing no relation to their functional purpose and merely attempting to make them look fast or pretty, is a travesty of the true aesthetic of a road vehicle'.

The interior (16) is equally successful. The radiused window surrounds in pressed metal eliminate ledges, corners, and other dust traps, and the wall panels are similarly merged into the floor. The tubular metal seat frames and grab rails, made from an aluminium alloy, do not require plating or polishing. The seat coverings are typical of London Transport practice, which is the result of long study. Moquette has been found to be the most suitable material, sympathetic to the touch and resistant to wear. The pattern, always basically geometric, displays strong contrasts of colour and tone value to reduce the visible effect of soiling, and usually incorporates some threads of a bright colour, such as red, which will appear fresh and new when the material is cleaned. Some other examples of fabrics are illustrated on page 120.



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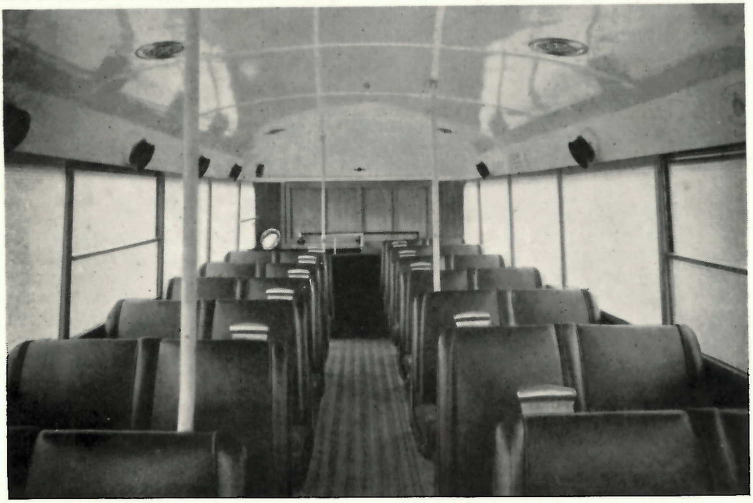

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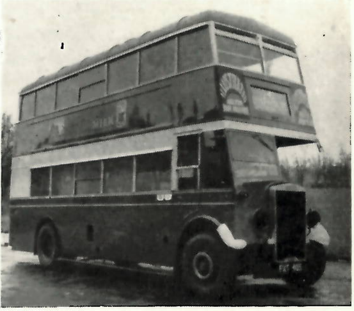
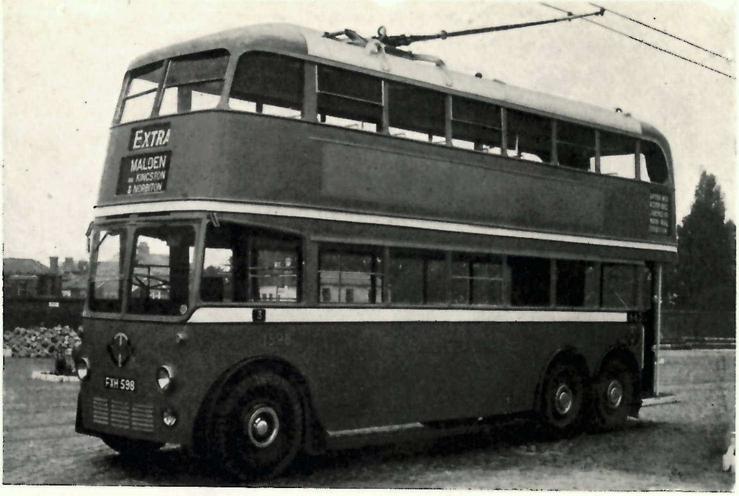


A wartime bus, built to Ministry of Supply specification, is shown on the right (18). An interior view of this type (17), complete with shrouded lights and anti-splinter fabric on the windows, affords an interesting comparison with the upper picture. Economy is effected in both material and man-hours by the substitution of pressed metal seat frames with cast handgrips, while a plain leather cloth replaces the patterned moquette. As in so many utility articles, the inevitable and somewhat austere simplicity gives considerable aesthetic satisfaction.



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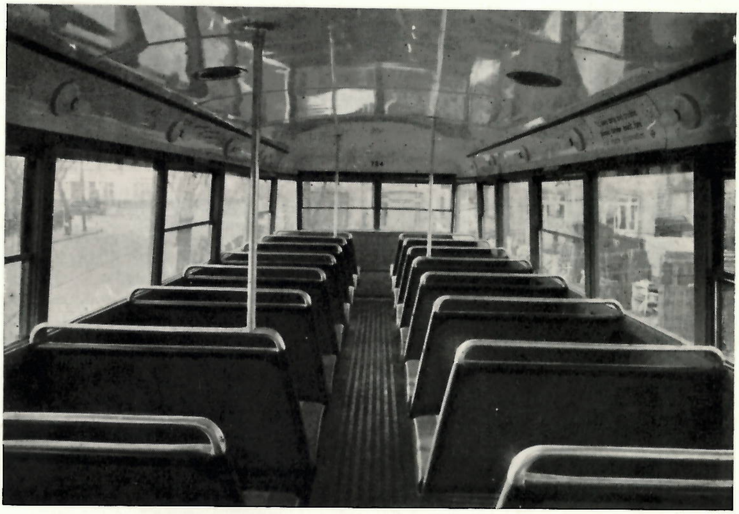

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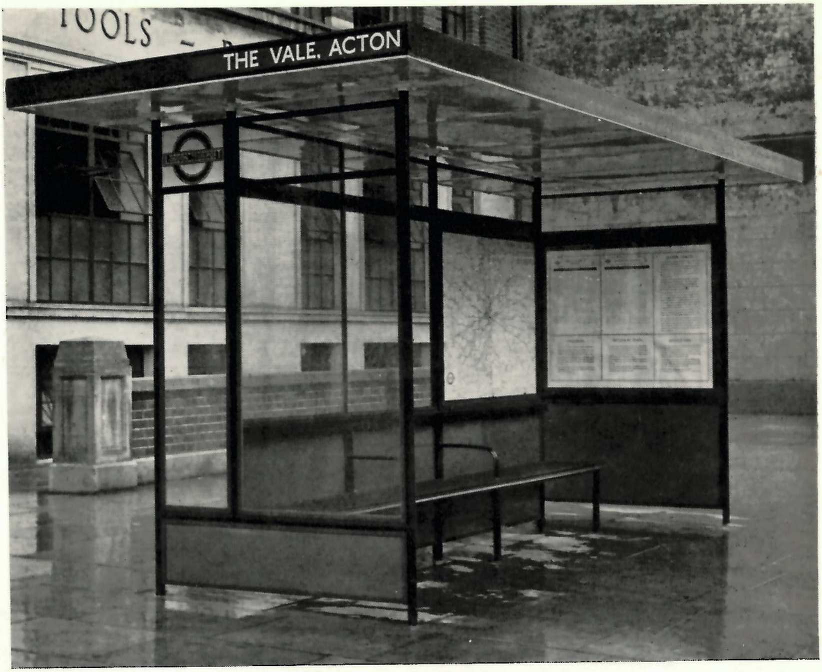
Some London areas are served by trolley-buses, which offer certain very obvious advantages, being free from smoke, smell, noise and vibration. Their defects, however, while less apparent, are no less real: relative inflexibility, higher capital cost, and the necessity of an overhead system of cables. A full front has been adopted for the trolley-bus, since there is no engine at the front requiring ready access. But apart from this feature, and its greater size, the design of the trolleybus (19, 20) is basically similar to that of a petrol-driven vehicle and is equally successful.



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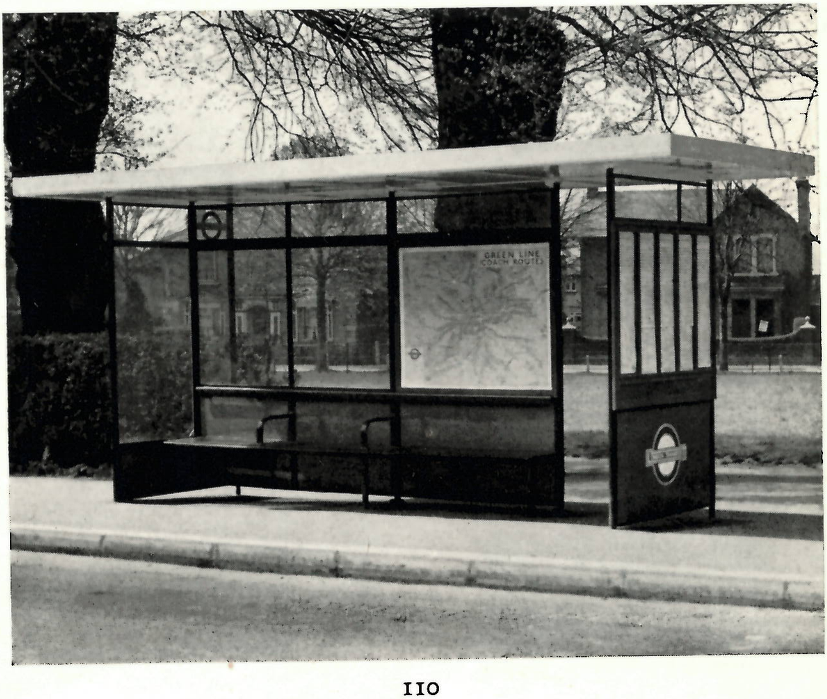

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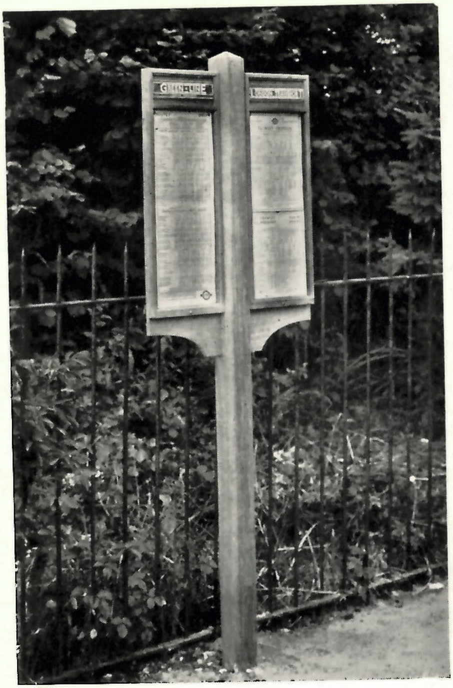

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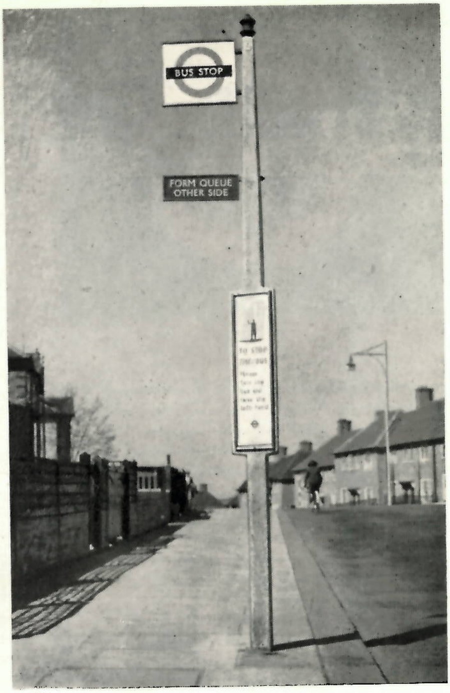

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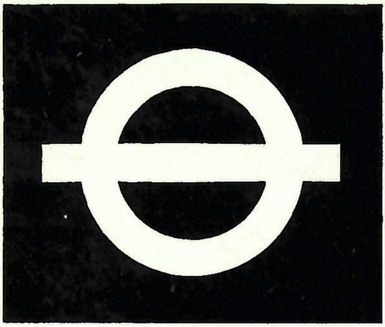
The visual impact of a surface transport system on the area it serves is not limited to the appearance of its vehicles. Signposts must be provided along the routes, and street shelters at the principal stopping places; information in the form of maps and timetables must be displayed.

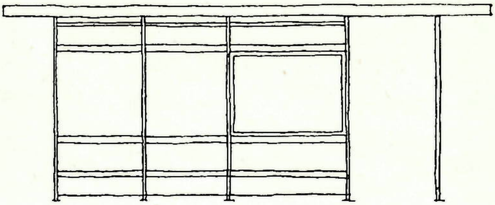
In street furniture of this kind London Transport design reflects the same careful planning which characterizes the whole system. Its shelters and signposts are an extension into the street of the architectural idiom of the Underground stations, and have clearly been designed with no less attention to detail than the stations themselves. They are extremely prominent, marking the route like a formation of brightly coloured flags, yet the effect is never one of untidiness or intrusion; on the contrary, by the regular repetition of simple shapes and colours, they create an orderly pattern which is in itself a unifying feature of the urban landscape.

The roadside shelters are a miniature essay in contemporary architecture, the appearance of which proclaims both their purpose and their method of construction. Essentially simple and unassertive, they blend comfortably with any kind of architectural surroundings, whether urban or rural. The large area of glass imparts to them an unsubstantial quality permitting the background to be seen not merely around but also *through* the structure, and so helping to harmonize the two.

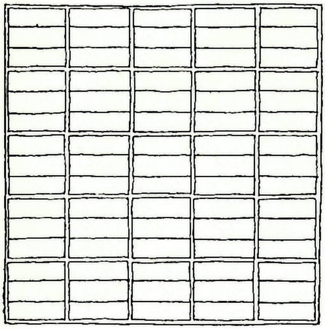
Provision is made for the display of a considerable amount of detailed information in printed form. All such material is positively located in metal frames which are an integral part of the structure, as shown in the accompanying photographs. The principal lines and planes of the structure are brilliantly echoed in the typographic layout, while the flowing pattern of the map affords both a visual contrast and a focal point. The whole erection becomes a composite unit for the provision of shelter and information, constructed in glass, metal, paper, and type.

On the same principle sign-posts frequently incorporate a double-sided panel (25) for the display of information or publicity. The most recent type, illustrated above, is made in terrazzo and achieves a satisfying form, which seems to rise naturally at the side of a granite kerb.

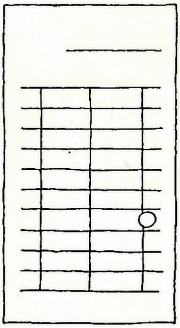




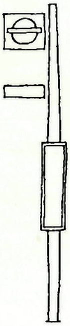
Shelter : front elevation



Station window framing



Bus ticket



Signpost

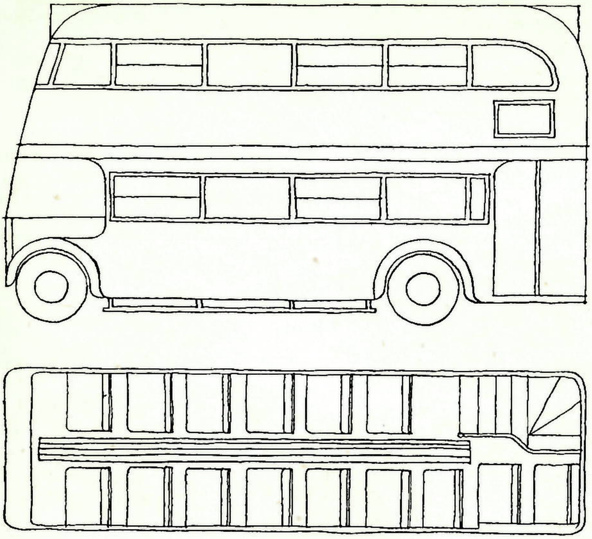
Familiar to every Londoner, the symbol of London Transport is a synthesis of its design idiom: a circle bisected by a horizontal line—two simple geometric motifs. Herein lies the clue to the fundamental geometric character of London Transport design, the basic principle which subordinates and unifies so many different concepts and materials.

'By beauty of shapes,' said Plato, 'I mean straight lines and circles, and shapes, plane or solid, made from them by lathe, ruler, and square. These are not, like other things, beautiful relatively, but always and absolutely.'

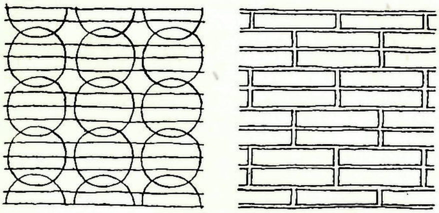
Once this geometric structure is perceived, examples leap to the eye. Every one of the accompanying diagrams will be found in photographic form in this issue of *Art and Industry*. The interplay of horizontals and verticals is everywhere apparent: sometimes in the frank disclosure of structural necessities, as in the roadside shelter (22, 23), sometimes by deliberate intention, as in the unorthodox laying of tiles (34) or a conventionalization of the ungeometric pattern of a map (28). A horizontal emphasis recurs persistently: in the lines of a bus, the treatment of windows (6) or the decoration of a fabric. The circle too recurs, sometimes inevitably, as in the wheels of vehicles, sometimes deliberately, as a foil to rectilinear compositions, exemplified in the platform seat (37) and in roadside shelters and signposts.

We find in its geometric structure a key to the 'timeless' quality of London Transport design, and equally to its contemporary spirit, which is in harmony with a mechanistic age. In the adoption of a rectangular module and the repetition of simple forms it bears a notable affinity to Georgian, that most English of all architecture.

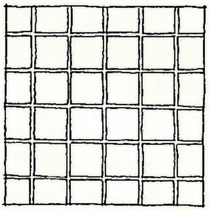
Although London Transport has employed in many fields designers of outstanding individuality, the totality of its design remains supremely impersonal: controlled, co-ordinated and unified within the framework of a geometric idiom.



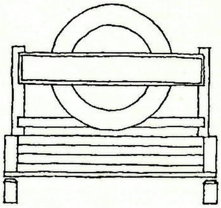
Bus : elevation and upper deck plan



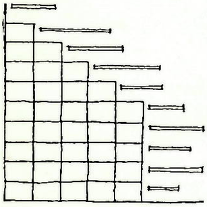
Moquettes



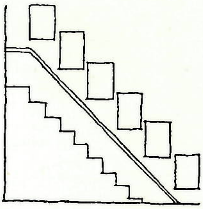
Tiles



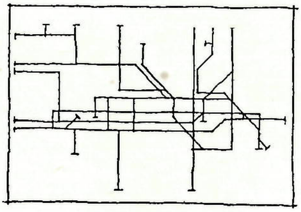
Seat



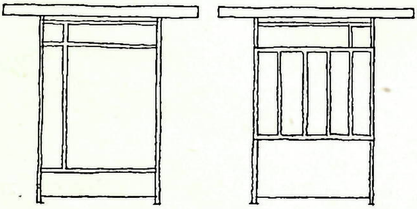
Fare board



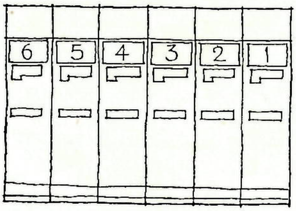
Escalator



Underground map

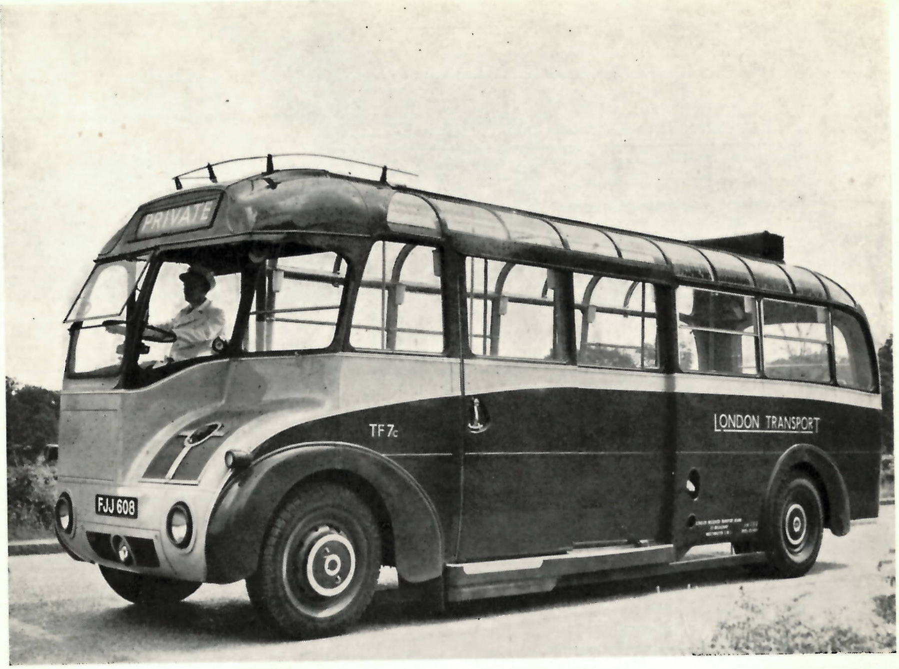


Shelter : end elevations

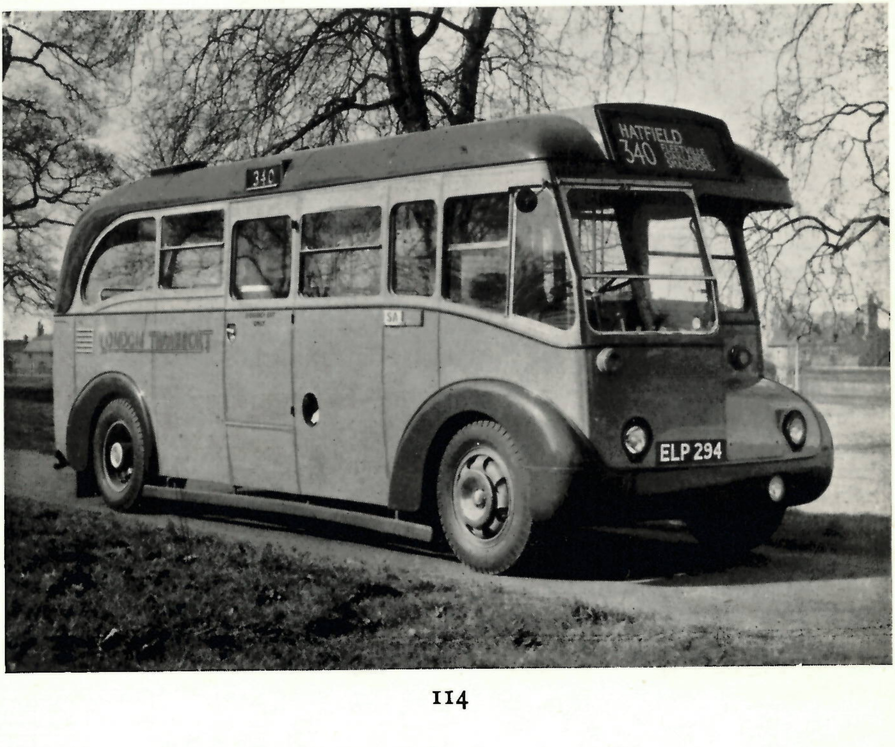


Ticket machines

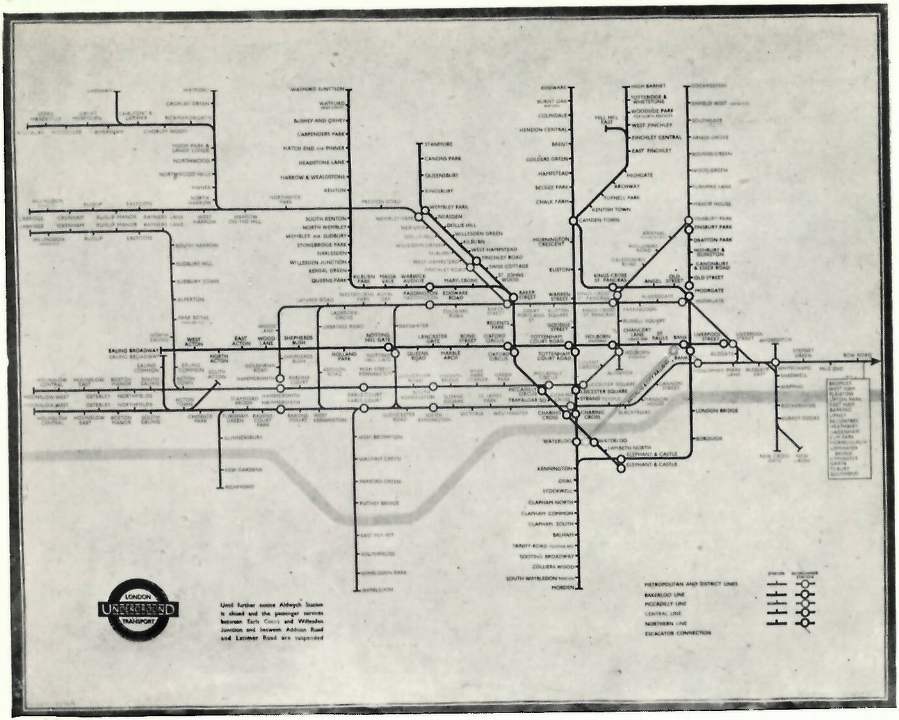
ronald ingles.


PRIVATE
TF7c
LONDON TRANSPORT
FJJ 608

26


HATFIELD
340
340
LONDON TRANSPORT
SA
ELP 294

27



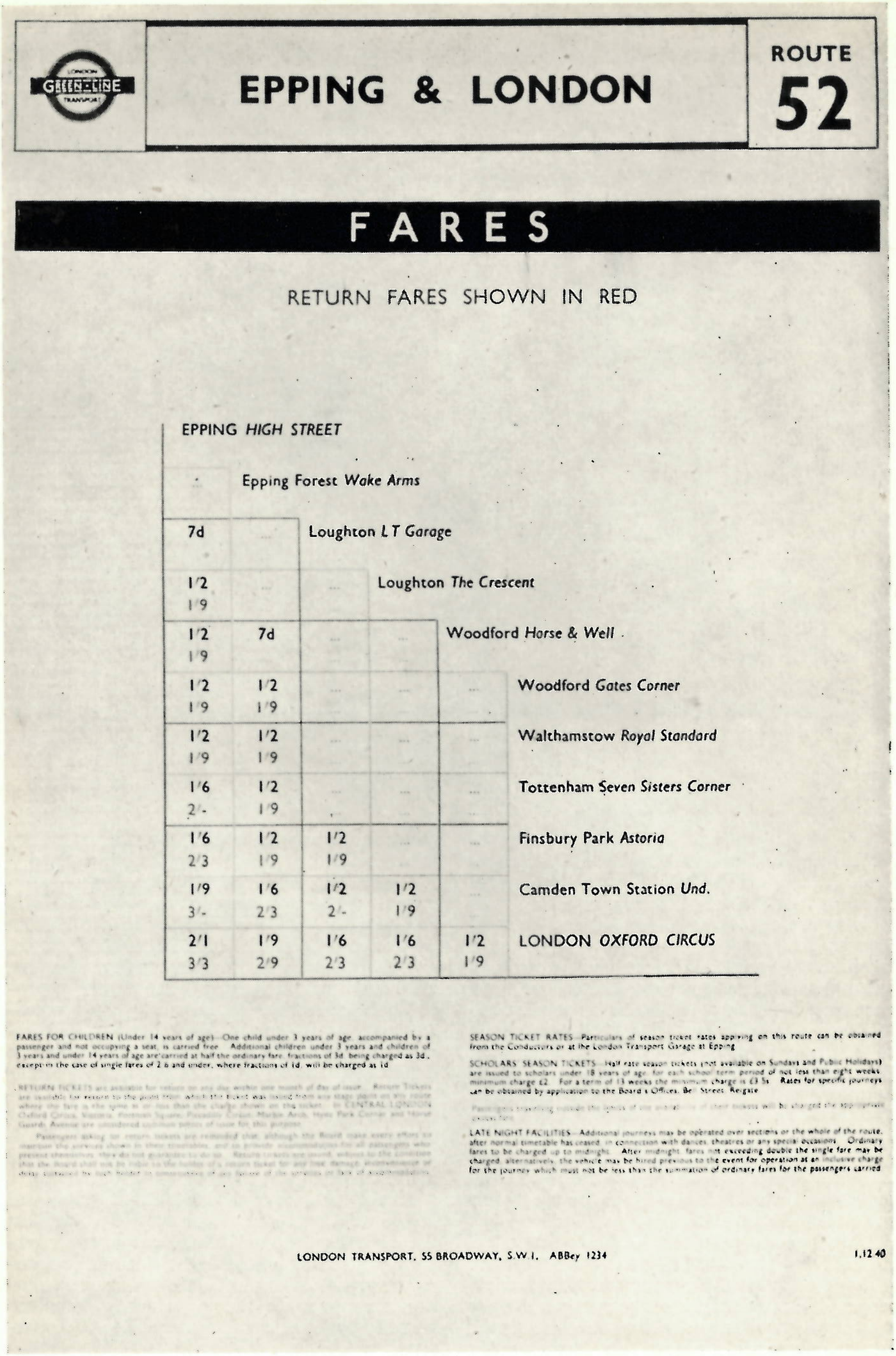
28

The Underground, comprising five separate railways and over twenty interchange stations, is a complicated system. The casual traveller might easily find it perplexing, but he is never called on to navigate uncharted waters, for London Transport has devoted careful study to the efficient sign-posting of its routes. The map reproduced above, and displayed on every platform, is a very beautiful piece of elucidation. The five lines appear in distinctive colours, red, blue, brown, green, and black. Where two routes share a common track for part of their length, the track is shown as a double line and the station names are repeated in the appropriate colours. This use of colour makes it easy to follow the sequence of stops on any given line, and conversely to see at a glance the route by which any required station is to be reached.

Interchange stations are indicated by open circles. It will be noted that this map does not attempt to show the stations in their actual geographic relationship; its purpose is simply to indicate their *sequence*. By reducing it to a formal geometric diagram, and spacing the names at regular intervals, the utmost clarity is achieved.

When the required line has been determined, the same system of colour notation is employed to guide passengers to the correct platform. The names of the different routes, and their corresponding interchange stations, are shown in white on a band of the appropriate colour, whereas those of the intermediate stations appear in black (31, 34). Reference to the photographs will show how the enamelled iron signs on which this information is displayed are treated as an architectural feature, never as an afterthought. At certain of the larger stations, the way to each platform is further indicated by marking the route with coloured lights.

In the route diagrams which are displayed inside the cars (4), a geometric treatment similar to that shown above is employed, interchange stations being ringed with the appropriate signal colour. Apart from the information they provide, these geometric maps are visually satisfying as a purely abstract pattern.



GREEN LINE

EPPING & LONDON

ROUTE
52

FARES

RETURN FARES SHOWN IN RED

EPPING *HIGH STREET*	Epping Forest *Wake Arms*	Loughton *L T Garage*	Loughton *The Crescent*	Woodford *Horse & Well*	
...					Epping Forest *Wake Arms*
7d	...				Loughton *L T Garage*
1/2 1/9	...	...			Loughton *The Crescent*
1/2 1/9	7d	...	...		Woodford *Horse & Well*
1/2 1/9	1/2 1/9	...	...	...	Woodford *Gates Corner*
1/2 1/9	1/2 1/9	...	...	...	Walthamstow *Royal Standard*
1/6 2/-	1/2 1/9	...	...	...	Tottenham *Seven Sisters Corner*
1/6 2/3	1/2 1/9	1/2 1/9	...	...	Finsbury Park *Astoria*
1/9 3/-	1/6 2/3	1/2 2/-	1/2 1/9	...	Camden Town *Station Und.*
2/1 3/3	1/9 2/9	1/6 2/3	1/6 2/3	1/2 1/9	LONDON *OXFORD CIRCUS*

FARES FOR CHILDREN (Under 14 years of age)—One child under 3 years of age, accompanied by a passenger and not occupying a seat, is carried free. Additional children under 3 years and children of 3 years and under 14 years of age are carried at half the ordinary fare, fractions of 3d. being charged as 3d., except in the case of single fares of 2/6 and under, where fractions of 1d. will be charged as 1d.

RETURN TICKETS are available for return on any day within one month of day of issue. Return Tickets are available for return to the point from which the ticket was issued from any stage point on this route where the fare is the same as or less than the charge shown on the ticket. In CENTRAL LONDON Oxford Circus, Victoria, Portman Square, Piccadilly Circus, Marble Arch, Hyde Park Corner and Horse Guards Avenue are considered common points of issue for this purpose.

Passengers asking for return tickets are reminded that, although the Board make every effort to maintain the services shown in these timetables, and to provide accommodation for all passengers who present themselves, they do not guarantee to do so. Return tickets are issued, subject to the condition that the Board shall not be liable to the holder of a return ticket for any loss, damage, inconvenience or delay caused to such holder in consequence of any failure of the services or lack of accommodation.

SEASON TICKET RATES—Particulars of season ticket rates applying on this route can be obtained from the Conductors or at the London Transport Garage at Epping.

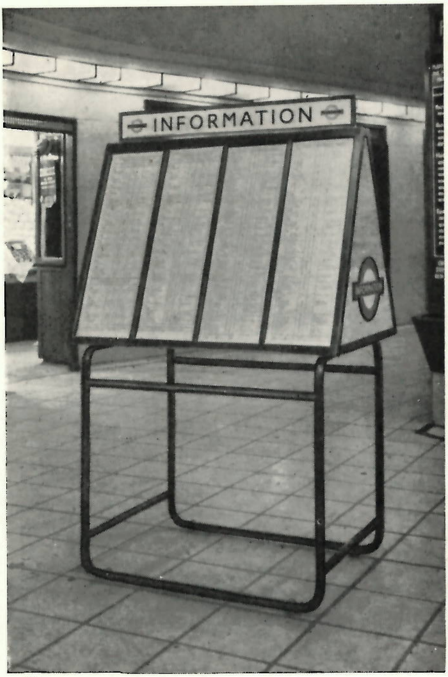
SCHOLARS' SEASON TICKETS—Half rate season tickets (not available on Sundays and Public Holidays) are issued to scholars under 18 years of age, for each school term period of not less than eight weeks, minimum charge £2. For a term of 13 weeks the minimum charge is £3 5s. Rates for specific journeys can be obtained by application to the Board's Offices, Bell Street, Reigate.

Passengers travelling outside the limits of the availability of their tickets will be charged the appropriate excess fare.

LATE NIGHT FACILITIES—Additional journeys may be operated over sections or the whole of the route, after normal timetable has ceased, in connection with dances, theatres or any special occasions. Ordinary fares to be charged up to midnight. After midnight, fares not exceeding double the single fare may be charged; alternatively, the vehicle may be hired previous to the event for operation at an inclusive charge for the journey which must not be less than the summation of ordinary fares for the passengers carried.

LONDON TRANSPORT, 55 BROADWAY, S.W.1. ABBey 1234

1.12.40



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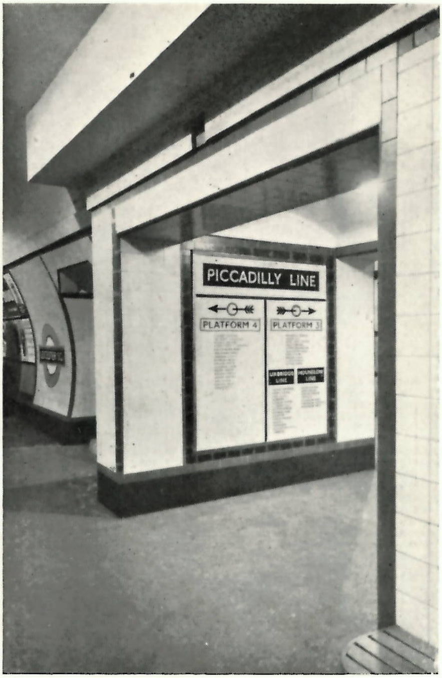


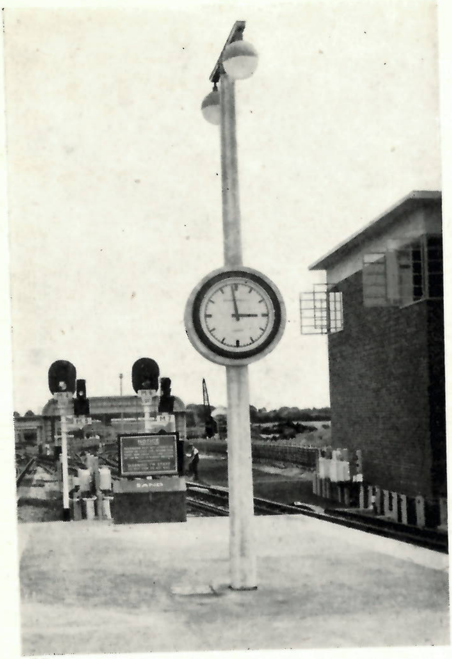
31

In 1916 the Underground Railway commissioned Edward Johnston to design a standard alphabet for use on its stations. To obtain the maximum legibility, Johnston adopted a sans serif letter, imparting to it the pure proportions of the Roman alphabet, and in this way achieved a triumphant synthesis of beauty and efficiency. His alphabet is beautiful because it preserves and clarifies the characteristic form of each individual letter; it is legible for precisely the same reason. It has now become a familiar feature of the London Transport system, and is used exclusively for vehicles, station names and route indicators, and all other display purposes.

It would be difficult to over-estimate the historic significance of Johnston's alphabet, which initiated a return to the sans letter. It was followed by numerous Continental variations (e.g. Erbar, Cable, and Futura), and inspired the design of the ubiquitous Gill Sans, as Eric Gill has recorded in his essay on typography. It is interesting to reflect that a development of such importance in the field of printing should owe its origin to an undertaking concerned primarily with transport; a convincing demonstration that 'design is indivisible'.

London Transport is in fact a pioneer not only in lettering but also in typography. For printed matter Johnston's alphabet, designed specifically as an inscriptional letter, is replaced by Gill Sans, which offers certain important advantages. It is available for hand or Monotype setting, and is supplied in several weights of letter in both roman and italic. This renders it particularly suitable for the setting of tabulated or classified material, as is beautifully exemplified by the Green Line fare board on the facing page. Here we see displayed in a piece of typography the qualities of organic architecture, its visual structure determined completely by its function. Both interest and clarity are achieved by the combination of differing weights of letter and rules, while its geometric foundation preserves in the whole composition a perfect harmony. Incidentally, the word 'fares' which appears in Johnston's letter, affords a comparison with the two weights of Gill Sans above and below.

For the printing of time-tables, where the tabulated matter is usually very small in size, Times Roman was adopted in 1937, an intermediate size of numerals being specially cut for this purpose.

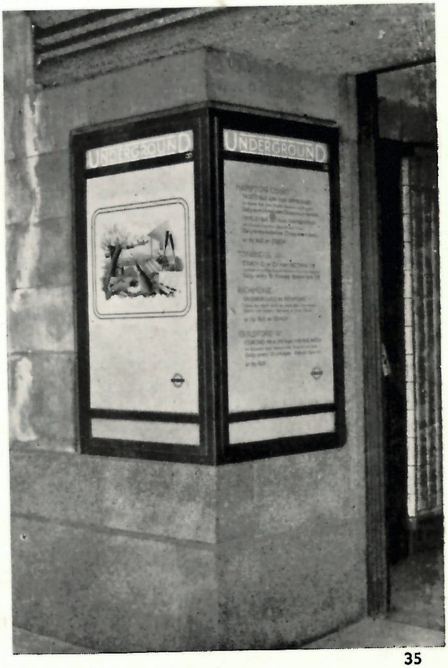


32

33

EDGWARE LINE
PLATFORM 2
MORDEN LINE
PLATFORM 1

34


UNDERGROUND
UNDERGROUND
HAMPTON COURT
RICHMOND
GUILDFORD

35

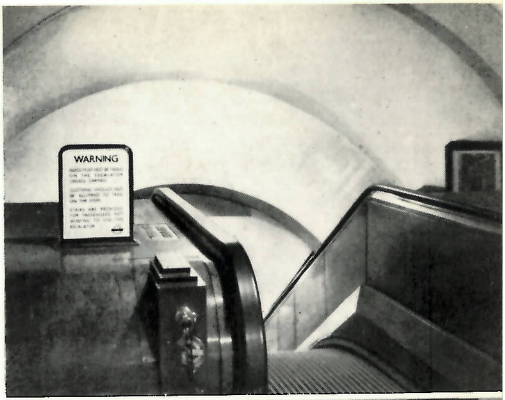
A large part of the success of London Transport design lies in its handling of detail. An Underground station incorporates many miscellaneous pieces of equipment, each of which deserves careful study. The architectural integration of such items as poster hoardings, direction signs and ticket machines already referred to, both enriches the structure and avoids the disorderly appearance of a number of unrelated elements. The two seats shown here illustrate the same principle: the upper one incorporates a name plate identical in size and design to those on the walls of the station, and thus falls into place within the larger pattern; in the lower picture, structural members actually form part of the seat.

This attention to detail is not restricted to areas which are visible to the public. The interior of the ticket booth (33) is as efficient and orderly a layout as anything that the passenger sees. Tickets are delivered automatically when the clerk presses the appropriate button on the keyboard which can be seen in the centre of the picture. This is located for left-hand operation, leaving the right hand free for taking fares. Efficiency is equally reflected in the appearance of the control cabin (39), an excellent example of modern operational technique, and in that of the combined clock and lamp standard (32).

Indeed, the sheer mechanical efficiency of London Transport design, divorced from aesthetic considerations, provides the material for a separate and fascinating study: the design of the 'door engines' which operate self-closing doors; the motors carried *beneath the floor* of passenger compartments, effecting a 15 per cent increase in payload; the automatic machines which deliver a freshly printed ticket and change for sixpence or a shilling. Such equipment is of course outside the scope of the present survey.

The design of fabrics for upholstered seats is particularly interesting. When moquette was selected, the stock patterns available were found to be of an extremely poor standard. The Board therefore commissioned a number of well-known textile designers who had no previous experience of the material to make a study of its technical requirements and produce a range of new designs. The outstanding success of this experiment is shown by the examples illustrated overleaf. It is instructive and entertaining to witness a transport undertaking showing the printing industry how to use type and the textile trade how to design fabrics.

36



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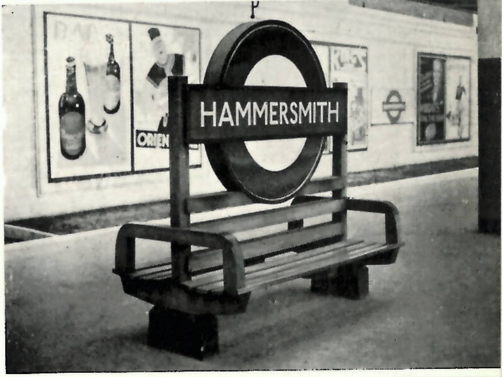

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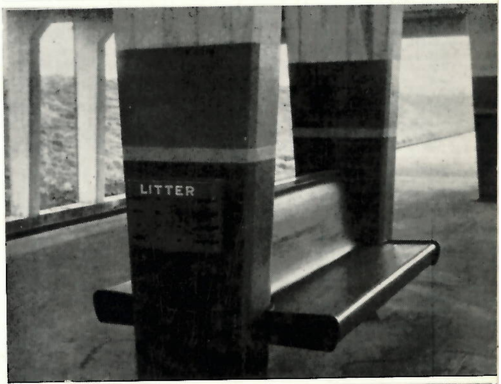

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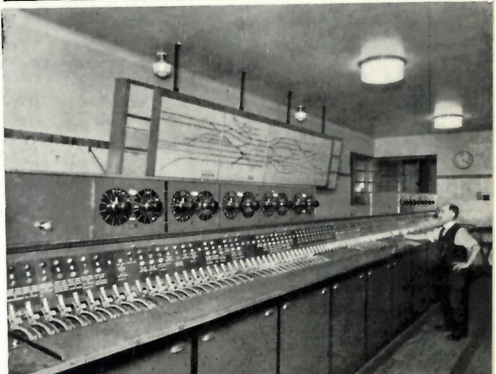

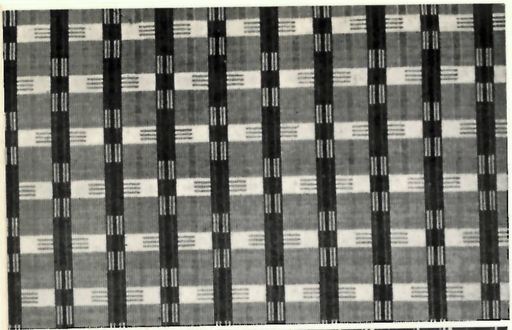

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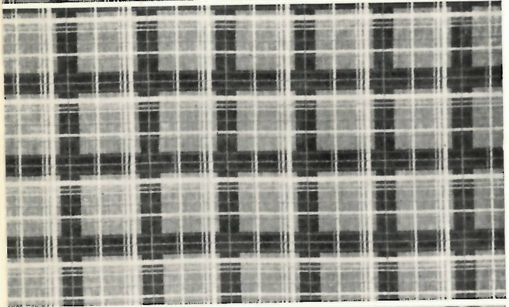

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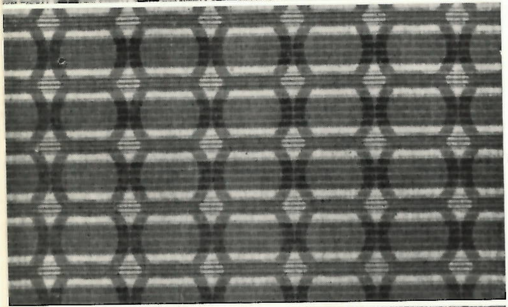

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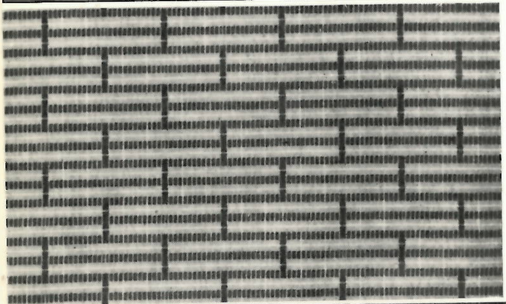

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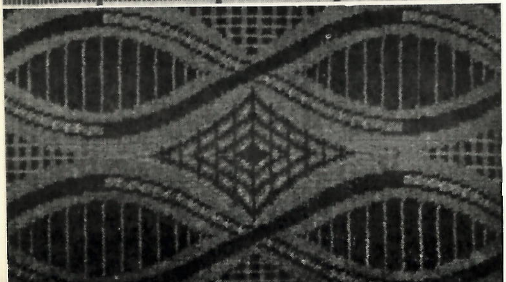


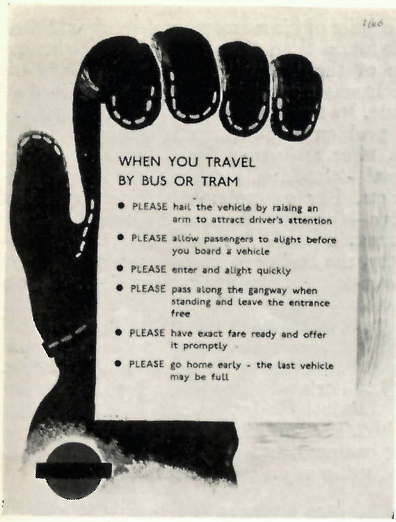
44

The posters of London Transport have consistently achieved something more than a sales message; they have provided a fitting decoration for the streets of a great metropolis, an education in modern painting, a channel by which many young designers have obtained early recognition, and a formative influence in the development of poster design. Before the restrictions on paper supply copies were frequently purchased by the public, and an Underground poster adorned the walls of many a school, office and even drawing-room.

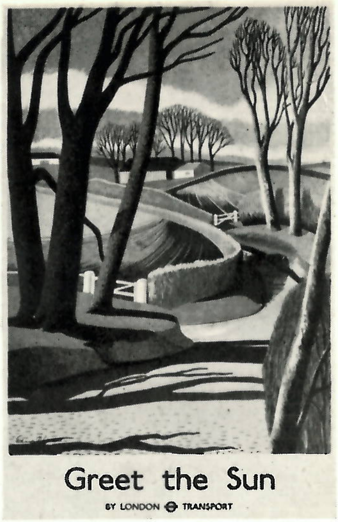
It is obviously impossible here to illustrate anything like a representative selection. The examples shown were picked not simply for their merit, but to demonstrate the great diversity of treatment which has been achieved without sacrificing a high aesthetic standard.

Street hoardings have been described, with somewhat misplaced enthusiasm, as 'the poor man's picture gallery'. While poster advertising remains relatively cheap and relatively unrestricted, there seems little hope that this epithet will ever be deserved. If the size of posters were limited to 30 in. by 40 in., and the cost of sites inversely increased, there would be some incentive to advertisers to use their space to better advantage. In Switzerland and Scandinavia, where a restriction on size is imposed, the standard of design is uniformly high, whereas in America, where size is apt to be admired for its own sake, the level of quality is correspondingly low. In this country London Transport, Shell Mex, and during the war, the Ministry of Information have convincingly demonstrated that there is ample talent available.

If the Board's design policy is open to criticism, it is not in the way in which it is implemented, but in the latitude permitted to commercial advertisers to impair what has been so successfully achieved. The aspect of advertisements displayed in or on transport vehicles is usually, in its total effect, disorderly and depressing. To eliminate commercial advertising from the system is not economically practicable, for the loss of revenue could only be met by a corresponding increase in fares; nor is it in fact desirable, for advertisements are capable of providing the same visual interest as the orderly and colourful route diagrams (4) displayed for passengers' information. The solution lies in the degree of control exercised. If a whole coach were let for example to a single advertiser, and the panels treated as a co-ordinated series, harmonizing in design and colour, the result could be wholly satisfactory.


WHEN YOU TRAVEL
BY BUS OR TRAM
PLEASE hail the vehicle by raising an arm to attract driver's attention
PLEASE allow passengers to alight before you board a vehicle
PLEASE enter and alight quickly
PLEASE pass along the gangway when standing and leave the entrance free
PLEASE have exact fare ready and offer it promptly
PLEASE go home early - the last vehicle may be full

45



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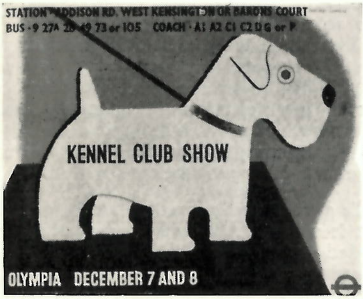
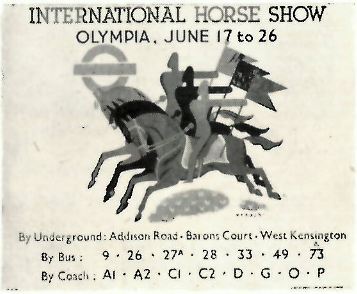
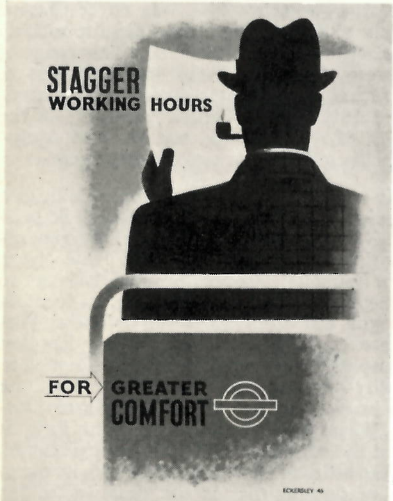

STATION · ADDISON RD. WEST KENSINGTON OR BARONS COURT
BUS · 9 27A 28 49 73 or 105 COACH · A1 A2 C1 C2 D G or P
KENNEL CLUB SHOW
OLYMPIA DECEMBER 7 AND 8

47


INTERNATIONAL HORSE SHOW
OLYMPIA, JUNE 17 to 26
By Underground: Addison Road · Barons Court · West Kensington
By Bus: 9 · 26 · 27A · 28 · 33 · 49 · 73
By Coach: A1 · A2 · C1 · C2 · D · G · O · P

48



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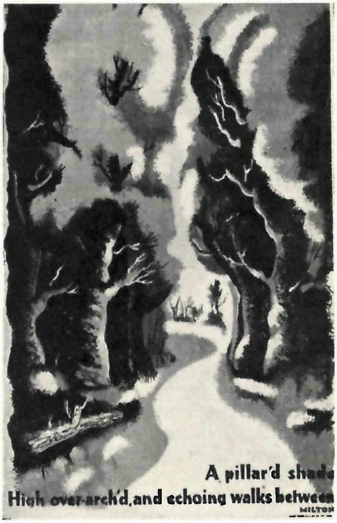

A pillar'd shad
High over-arch'd, and echoing walks betwee
MILTON

50

WHEN THE London Passenger Transport Board was established in 1933 it acquired, together with the Underground Railway, both Frank Pick and a design policy. Pick became, under Lord Ashfield, Vice-Chairman of the Board; his policy, already endorsed by a convincing record of success, was now directed to problems of increasing scope and magnitude. He had a peculiar gift for finding the right collaborators, for imparting his point of view and for inspiring enthusiasm. He did not seek established reputations, but men who were particularly qualified for the job in hand; and since the job was frequently one for which no precedent existed, he had to rely on his own judgment of their ability. This he did repeatedly and with consistent success. It was Pick who commissioned from Edward Johnston the design of the now famous 'Underground' letter, initiating a new era in typographic design; Pick who, with Charles Holden, laid the foundations of modern transport architecture. It was Pick's judgment and support, often in the face of considerable opposition, which established the reputations of many young graphic artists, of whom McKnight Kauffer is perhaps the most outstanding example.

In spite of his many responsibilities, Frank Pick found time to undertake the chairmanship of the Council for Art and Industry which was set up in 1934 by the Board of Trade. Its report reveals an understanding of the problems of industrial design which is still, after ten years, far in advance of the official attitude of industrialists and educationists. For example: 'All the elements of design—function, form and economy—form an organic whole . . . for the designer in industry, the ability to co-operate with others is essential. . . . Designers should be properly organized; they should adjust themselves to mass production, machine technique, and economic and commercial necessities, and should be trained on this basis in the schools. . . . Industrialists should receive some training in industrial design, should extend their research habit of mind into the design side of their business, and should give the artist full recognition as an expert technician.'

In his own business Pick practised what he preached. It must be doubtful how far he was able to foresee the ultimate results of his policy, for a design idiom is not instantly created, but developed slowly and often painfully. What he did see clearly was his objective, the manifestation of functional efficiency in forms which are simple, logical, and visually co-ordinated; and to this end he directed the efforts of all who worked with him.

He gave the public not what he conceived that it wanted, but what it unquestionably needed—a visual education. There are only two ways with public taste: you must either lead or follow it. In a matter which was to him of such importance Pick was never content merely to follow. As a medium for railway publicity, the poster achieved a new range of expression, and significant developments in the technique of poster design can be attributed directly to his encouragement. In the design of rolling stock, stations and equipment his influence is equally apparent.

He was never led away in the pursuit of a conscious style, the dangers of which he realized as fully as that other pioneer of contemporary design, Walter Gropius. 'The object of the Bauhaus,' Gropius has said, 'was not to propagate any style, system, dogma, formula or vogue, but simply to exert a revitalizing influence on design.' There is no London Transport 'style', which would be doomed to sterility—it is a living idiom which for those who knew him, and for the people of London, perpetuates the spirit of Frank Pick. It is not the results he obtained during his life, but the attitude he created to the whole question of design, that is the measure of his achievement.

INDEX

Train section: Chief Mechanical Engineer (Railways), W. S. Graff-Baker, B.Sc., A.C.G.I., M.I.Mech.E., M.Inst.Loco.E., M.Inst.T.

1 Hammersmith and City Line motor car, 1938

2 Tube train, 1938 stock

3 Experimental streamlined train, 1936

4 Tube train, interior view, 1938

5 Surface line car, interior view, 1938

Stations:

6 Chiswick Park, ticket hall

7 Northfields

8 Arnos Grove

9 Chiswick Park

10 Cockfosters

11 Leicester Square, booking hall

12 Automatic change and ticket machines

13 Automatic ticket machines

Bus and coach section: Works Manager, E. C. Ottaway, A.M.I.Mech.E.

14 LT-type bus, 1931; view of staircase

15 RT-type bus, 1939; exterior view

16 RT-type bus, 1939; interior view, lower deck

17 Wartime bus, M.O.S. specification; upper deck

18 Wartime bus, M.O.S. specification; exterior view

19 Trolleybus, 1939; exterior view

20 Trolleybus, 1937; upper deck

21 Wartime bus, Guy type, 1943

Street furniture:

22 Bus shelter, 1939

23 Bus shelter, 1937

24 Bus and coach time table, 1937

25 Signpost in terrazzo, 1939

26 Private hire coach, type TF3, 1939

27 Rear-engined 20-seater bus, Leyland Cub, 1938

Information:

28 Underground map designed by H. C. Beck, 1941

29 Green Line fare board, 1940; the Bournehall Press

30 Information lectern, 1935

31 Enamelled iron direction sign, 1935

Equipment:

32 Combined clock and lamp standard, 1933

33 Booking office, Leicester Square, 1936

34 Fire equipment, Leicester Square

35 Bronze poster frames, 1937

36 Escalator, Charing Cross, 1937

37 Combined platform seat and station sign, 1933

38 Platform seat and bronze litter basket, 1933

39 Acton Town signal cabin, 1934

Fabrics:

40 By Enid Marx, 1943

41 By Marion Dorn, 1939

42 By Marion Dorn, 1939

43 By Marion Dorn, 1939

44 By Enid Marx, 1946

Posters:

45 By Zero (Hans Schleger), 1944

46 By Edwin Lancaster, 1939

47 By Eckersley Lombers, 1938

48 By Stanley Herbert, 1937

49 By Eckersley, 1945

50 By E. McKnight Kauffer, 1932

NOTES and NEWS

BRITAIN *CAN* MAKE IT

WE ARE GETTING ON. The Victoria and Albert Museum is transformed into a hive of activity. Intriguing models lie around the place, which swarms of craftsmen are consulting. The dry bones of authenticity are being clothed with the imaginative décor of the showman. Lath and plaster and laminated board are creating an Aladdin's cave, intriguing, voluptuous, offering such rewards to the discerning. Don't forget the date or the place. The 'Britain can make it' exhibition opens on September 24th at the Victoria and Albert Museum. It is a foretaste of good things to come.

LONDON TRANSPORT

THE LONDON PASSENGER TRANSPORT BOARD is maintaining tradition. It has just announced the appointment of a new advisory art committee to advise the chairman on art, as applied to the production of posters and other forms of artistic endeavour. The members of the Committee are Dr. Herbert Read, Mr. William Pettigrew Gibson, Keeper of the National Gallery, and Mr. Philip James, Director of Art of the Arts Council of Great Britain.

BOOK DESIGN EXHIBITION

THE NATIONAL BOOK LEAGUE'S second Book Design Exhibition shows that austerity has not broken the spirit of British Book designers. It shows a remarkably high standard of achievement in circumstances of extreme difficulty. In fact the difficulties have been accepted in a spirit of challenge to the initiative and imagination and have proved a stimulant. When conditions are more favourable it will be seen that the restrictions and limitations of war conditions have actually advanced rather than retarded British standards.

PRINCIPALS OF LONDON ART SCHOOLS

THE LONDON COUNTY COUNCIL are inviting applications for the posts of Principal of the Central School of Arts and Crafts, Southampton Row, W.C.1, and Principal of the St. Martin's School of Art, Charing Cross Road, W.C.2. Applicants should apply for the necessary forms to the Education Officer (T.1), The County Hall, Westminster Bridge, S.E.1. Forms must be returned in the case of the Central School of Arts and Crafts by September 30th, and in the case of the St. Martin's School by October 14th.

DUTCH POSTERS

WE REGRET THAT two posters which were reproduced in the August issue of *Art and Industry* were incorrectly captioned. The 'M.G.' poster on page 42 and the Queen Wilhelmina poster on page 45 were designed by F. H. K. Henrion.

JOHN GLOAG

JOHN GLOAG CONTINUES his evangelism. He was recently one of the speakers at a conference held in New York and organized by the American Society of Industrial Designers, of which Walter Dorwin Teague is the chairman. He advocated, as we are constantly doing, the study of production process and materials, also marketing and selling in addition to aesthetic training.

INDUSTRIAL DESIGN CONSULTANT

UNDER THE TITLE of Warnett Kennedy and Associates, Warnett Kennedy, who was formerly one of the Crawford Group, has now formed his own consultancy at No. 11 Bentinck Street, London, W.1.

MODEL MAKING

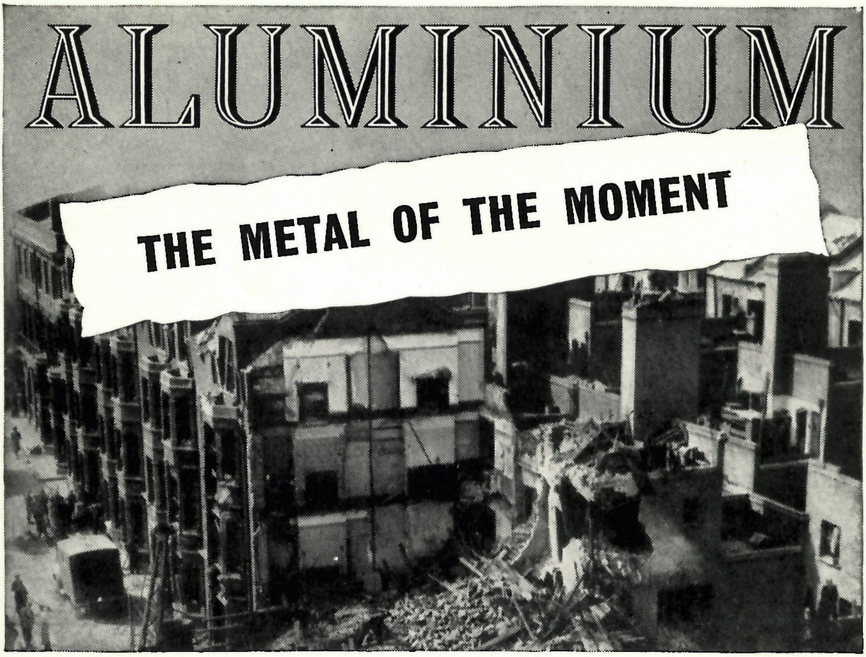
THE VALUE OF MODELS as a training factor for the work contemplated in craft schools rehabilitation centres, primary and secondary schools and advanced training centres cannot be over-emphasized. There is undoubtedly a wide field for the making of models in progressive educational establishments today and the publication of 'The Craft of Model Making' (The Dryad Press, Leicester) is most opportune.

Mr. Thomas Bayley, R.B.A., A.R.C.A., who is to be congratulated on a splendid little volume, is particularly well equipped for the task of authorship. Apart from being an instructor of model making and modelling, he is a pioneer teacher of the craft as an educational feature and has wide experience as a model maker for industries and exhibitions.

Although primarily intended for the student the book contains a great deal of information for more advanced practitioners and should prove of considerable interest to all who are concerned with sound development of honest craftsmanship.

HAVE YOU ENTERED?

YOUR LAST CHANCE to enter for *Art and Industry's* second Industrial Design Competition. Full details appeared in the August issue. An entry form will be found on page iii of the cover of this issue.



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Manufacturers of base papers for plastic laminates, insulating papers, abrasives and shoe sockings; waxing cartridge, telegraph parchment, tracing, dyeline, ferro-prussiate, and photographic base. Manufacturers also of natural tracing paper, drawing cartridge, vegetable parchment, greaseproof, and glassine

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THE HON. MISS MONCKTON, by Sir Joshua Reynolds, showing detail of brushwork. By permission of the National Gallery.

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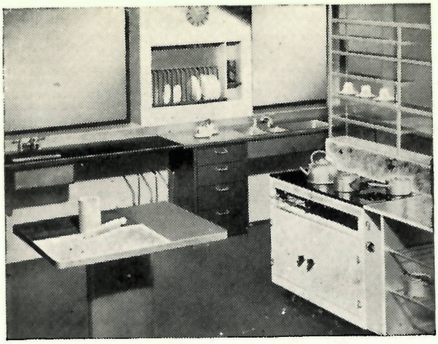

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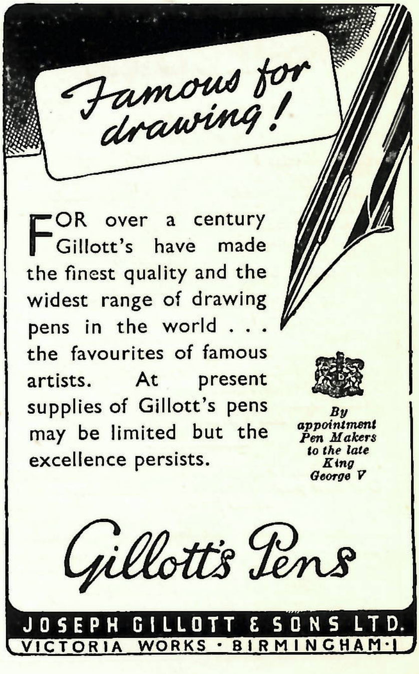

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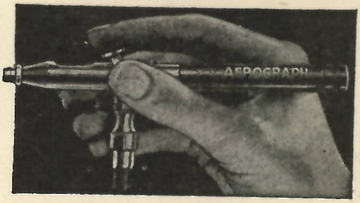

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Art and Industry Competitions

No. 2. Exhibition Stand

To be cut off and forwarded in accordance with Rule 3. (See Announcement on page 57 of the August issue.)

No. of sheets sent

....

Stamps enclosed ....

PLEASE WRITE IN BLOCK LETTERS

I certify the entries submitted to be my own original work.

PSEUDONYM ....
FULL NAME..
ADDRESS..
....
SPONSORING ART SCHOOL (IF ANY) ....
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NOTE CLOSING DATE: OCTOBER 30th, 1946

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8.3.1946.

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The Manager,
Messrs Winsor & Newton

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